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Code-Switching in L2 Spanish: A comparison of French and English learners

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Abstract

This dissertation investigates whether L2 Spanish learners' grammar intuitions on code-switching (CS) show evidence of the predictions made by the Functional Head Constraint (FHC) proposed by Belazi, Rubin, & Toribio (1994). Building on this theory, the present work supports the idea that L2 learners have an intuitive sense of code-switching well-formedness, i.e., they count on unconscious grammatical principles to produce code-switched utterances as well as to assess their grammaticality. Our primary research question is: given the usual absence of CS input that classroom L2 learners receive, will their grammar intuitions on CS show evidence of the predictions made by the FHC? In order to answer this question, we carried out two experiments with two different groups of L2 Spanish learners: native speakers of English and French with different levels of proficiency in the L2.

In Experiment 1, we used an Acceptability Judgment Task (AJT) administered in Toribio (2001a) to evaluate participants' grammatical intuitions on (un)grammatical switching boundaries. In Experiment 2 we employed two tasks to have two types of experimental data: A Self-paced Reading Task (SPRT) which looked at participants' real time processing, and an AJT to observe their grammatical intuitions.

Confirming our hypothesis and in line with the FHC, we found that participants have accurate grammar intuitions about CS. These results are consistent with previous studies (Toribio, 2001a; Dussias, 2003; Koronkiewicz, 2018; Giancaspro, 2013, 2015) at proving that L2 learners exhibit linguistic knowledge of the structural restrictions in CS. The analysis per groups further showed that both the English and French intermediate learners' exhibited

more accurate acceptability responses than the beginner group. Intermediate L2 Spanish learners distinguished between grammatical and ungrammatical CS while beginners had problems recognizing grammaticality especially in switches after modal/auxiliary, quantifier, preposition and adjectives. Results obtained in both experiments demonstrate that L2 learners treat differently and distinguish grammatical and ungrammatical CS. However, as seen in Experiment 1, they are not always successful at judging CS as acceptable or unacceptable based on the FHC predictions. The present study contributes to our understanding of L2 learners' grammatical knowledge on CS constraints by examining the grammar intuitions and processing and the role of L2 proficiency and their L1 within and between groups.

Keywords

Functional Head Constraint, intrasentential code-switching, L2 learners, grammatical intuitions, acceptability judgments, syntax, Spanish-French code-switching, Spanish-English code-switching.

Summary for Lay Audience

This dissertation investigates whether L2 Spanish learners' grammar judgment on code-switching (CS) show evidence of the predictions made by the Functional Head Constraint (FHC) proposed by Belazi, Rubin, & Toribio (1994). Building on this theory, the present work supports the idea that adult second language (L2) learners have an intuitive sense of code-switching well-formedness, i.e., they count on unconscious grammatical principles to produce code-switched utterances as well as to assess their grammaticality. Our primary research question is: given the usual absence of CS input that classroom L2 learners receive, will their grammar intuitions on CS show evidence of the predictions made by the FHC? In order to answer this question, we carried out two experiments with two different groups of L2 Spanish learners: native speakers of English and French with different levels of proficiency in the L2.

Confirming our hypothesis and in line with the FHC, we found that participants have accurate grammar intuitions about CS. We found that L2 learners exhibit linguistic knowledge of the structural restrictions in CS. Results obtained in both experiments demonstrate that L2 learners treat differently and distinguish grammatical and ungrammatical CS. However, as seen in Experiment 1, they are not always successful at judging CS as acceptable or unacceptable based on the FHC predictions. The present study contributes to our understanding of L2 learners' grammatical knowledge on CS constraints by examining the grammar intuitions and processing and the role of L2 proficiency and their L1 within and between groups.

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Chapter 1

1 Introduction

Code-switching (hereafter CS) is a linguistic phenomenon in which bilinguals fluently use two or more languages within a sentence or between sentences during the same speech event (Poplack, 1980), as in the following examples:

(1) Code-switching within a sentence (i.e. intrasentential)

Los estudiantes have seen the Italian movie. (Spanish-English, Belazi et al., 1994)

'The students have seen the Italian movie.'

(2) Code-switching between sentences (i.e. intersentential)

Llegamos a los Estados Unidos en los 60s. New York was our home. (Spanish-English, Toribio, 1999)

'We arrived in the United States in the 60s. New York was our home.'

Examples (1) and (2) show CS from Spanish into English. Since it is generally assumed using only one language in a conversation is the norm, the sentences above may be considered by some as an exceptional violation of social and linguistic rules. Nevertheless, CS is in fact a frequent communicative behavior among immigrant communities, native speakers of a language minority, and in many interactions in established bilingual/multilingual communities, to mention some examples.

A number of studies have provided evidence for the systematic behavior of CS showing that it is not a mere random mixing of two languages. This study builds on one of the most important current analyses of the constraints involved: the Functional Head

Constraint Theory (FHC) (Belazi, Rubin, & Toribio, 1994), and examines its predictions with reference to acceptability judgments of two linguistic groups: (a) a group of first language (L1) English speakers, and (b) a group of L1 French speakers, both of which were learning Spanish as a foreign language. We will focus on examining knowledge of the constraints that govern CS following Belazi et al's (1994) FHC. According to the FHC, code-switches between a lexical head and its complement may occur naturally in CS while switches between a functional head and its complement are unacceptable. In following these predictions, the present study observes whether L2 learners are sensitive to the (un)grammaticality in English/French-Spanish switches.

Outline of the remaining chapters

The remainder of the dissertation will be organized as follows. **Chapter 2** reviews the literature on code-switching and provides the necessary rationale for some of the concepts that will be discussed in the rest of the dissertation. This chapter describes in detail the various syntactic constraints that have been proposed on CS research. Some of the previous works that we review include Muysken's (2000) code-switching typology, Pfaff's (1979) earlier account on code-switching, Poplack's (1980) and Sankoff and Poplack's (1981) linear constraints, Belazi et al's (1994) hierarchical approach to code-switching, and MacSwan's (1999, 2000) account on code-switching from a Minimalist point of view. Particular attention is paid to the Functional Head Constraint as it makes accurate predictions for the acceptability of switching points in our intrasentential code-switching data. Subsequently, the FHC emphasizes the role played by speakers' competence and intuitions in correctly assessing code-switching strings.

The results of the experimental studies are presented in Chapters 3 and 4. In particular, **Chapter 3** reports on Experiment 1 for this study, which is followed by the results found in the acceptability judgment task. **Chapter 4** describes Experiment 2, discussing the findings of the data from the second acceptability judgment task and the self-paced reading task. **Chapter 5** provides a summary of the results, focusing on the three key themes that are addressed throughout the project: learners' sensitivity and intuitions to syntactic well-formedness in code-switching, the difference in reaction time for bilinguals when processing un/grammatical mixed-language information, and the role played by group membership in the results. Chapter 5 draws upon the entire thesis, tying up the various theoretical and empirical strands, offering a discussion on the findings and a conclusion to the dissertation. It also provides a discussion of the implications of the findings to future research into the grammatical intuitions in code-switching.

Chapter 2

2 Theoretical framework

The purpose of this chapter is to review the literature on code-switching and to provide the necessary rationale for some of the concepts that will be discussed in the rest of the dissertation. Section 2.1, provides a brief overview of the code-switching structural patterns: tag switching, intersentential and intrasentential code-switching. It continues in section 2.2 discussing the distinction between CS and borrowing phenomena as different language contact occurrences (morphophonological and semantic adapted borrowings (established loan words and nonce borrowing)). Section 2.3 focuses on an overview of the study of CS and section 2.4 moves on to describe the main proposed constraints on CS that are relevant for this project with special attention to the discussion of Belazi et al's (1994) hierarchical approach to code-switching and its syntactic constraints. Section 2.5 provides a brief overview on L2 and CS. Finally, section 2.6 presents the structural differences and similarities between Spanish, French and English since they are fundamental in our study.

2.1 Code-switching structural patterns

According to Poplack (1978, 1981), there are three patterns of language alternation amongst bilingual speakers engaging in code-switching: tag switching, intersentential, and intrasentential code-switching (Poplack, 1978, 1980, 1981). The first type, ***tag switching***, refers to the inclusion of idiomatic expressions, interjections, single noun switches, and fillers such as in (1) and (2) below:

(1) Él es de México y así los criaron a ellos, *you know*. (Spanish-English, Winford, 2003)
'He is from Mexico and they raise them like that, you know.'

(2) So, *deberías llevarte el paraguas.* (English-French, Toribio, 2001a)
'So, you should take the umbrella.'

Since, in many cases, tag switches are culturally bounded, speakers prefer to insert foreign idiomatic expressions and lexical items (e.g., *¡Ay Dios mio!*, *mi madre santa*, etc.) because of the emotional association and meaning that such enunciations may carry. Tag switches can occur at any point in the sentence with a low possibility of producing ungrammatical phrases. As a result, switching tags in the discourse represent the less complex type of code-switching and does not involve high levels of bilingual proficiency.

A second type of code-switching, ***intersentential code-switching***, occurs in situations where speakers switch languages at phrasal, clause or discourse boundaries, as shown in (3) and (4):

(3) *Llegamos a los Estados Unidos en los 60s.* New York was our home. (Spanish-English, Toribio, 2001a)
'We arrived in the United States in the 60s. New York was our home.'

(4) In the spring, *los árboles son verdes*. (Spanish-English, Rakowsky, 1989)
'In the spring, the trees are green.'

It is worth noting that in intersentential CS, each code-switched utterance fully instantiates the grammar of the language involved so violations are unlikely. In (3) and (4), switching occurs at clause boundaries and each segment meets the language rules of the language in use, English and Spanish respectively. Intersentential CS involves larger and more complex segments, thus it entails a higher degree of bilingual competence than tag switching production. Speakers must demonstrate a rather advanced proficiency level in both languages to produce grammatical code-switched sentences.

Besides tag switching and Intersentential CS, there is one last and more elaborated form of language switch: ***intrasentential code-switching*** (see also Myers-Scotton, 1993, who refers to this type of CS as classic code-switching). In this case, CS entails a switch within the boundaries of a sentence or a clause, as exemplified in the Spanish-French sentence in (5) and in the English-Spanish sentence in (6):

(5) *Entonces nos dimos cuenta* que c'était le temps de sortir d'ici! (Spanish-French, our own example)

'Then we realized that it was the time to get out of here!'

(6) Code-switching among bilinguals *ha sido la fuente de numerosas investigaciones*. (English-Spanish, Toribio, 2001a)

'Code-switching among bilinguals has been the source of numerous studies.'

Research has shown that switches occurring within the same sentence, as in (5) and (6), are exclusively produced by speakers with a high degree of bilingual competence (Poplack, 1980; McClure, 1981; Zentella, 1997, among others). Therefore, when

switching at the intrasentential level, speakers spontaneously alternate two grammatical systems in their discourse with no signs of interruption, hesitation or pause.

Paradoxically, this type of CS has been the most negatively perceived by educators and researchers (Poplack, 1980). Thus, even if only highly bilingual speakers can code-switch without violating the syntactic rules of the languages in use, intrasentential CS has been regarded as negative linguistic interference or as the result of imperfect language acquisition.

According to Muysken (1995) these three types of CS may be categorized into three distinct patterns: alternation, insertion, and congruent lexicalization. In the alternation pattern the two languages remain relatively separated in an A–B configuration as shown in Figure 2.1:

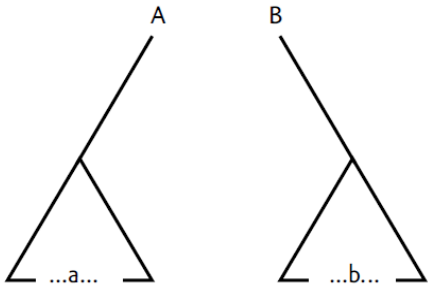


Figure 2.1: Alternation pattern (Muysken, 1997: 362)

In alternational CS there is a switch between the two languages in which a part of the sentence exchanges the lexicon and the grammar with the other language, as in (7a) and (7b):

(7) a. Sometimes I'll start a sentence in English *y termino en español*. (English-Spanish, Poplack, 1980)

'Sometimes I'll start a sentence in English and I finished in Spanish.'

b. *Entonces nos dimos cuenta* que c'était le temps de sortir d'ici! (Spanish-French, our own example)

'Then we realized that it was the time to get out of here!'

Insertional code-switching implies insertion of a constituent such as a word or a phrase in an A–B–A structure, as in Figure 2.2:

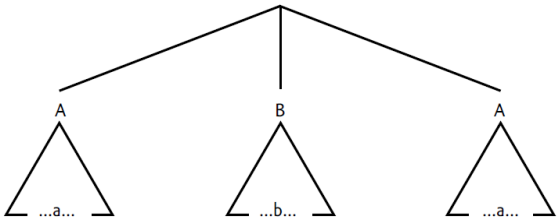


Figure 2.2: Insertion pattern (Muysken, 1997: 363)

This type of code-switching, also denominated ***embedding*** (Myers-Scotton, 1993), involves filling in a string of a language into an utterance structured in the other language as in (8):

(8) *yo anduve* in a state of shock *pa' dos días.* (Spanish-English, Pfaff, 1979)

'I was in a state of shock for two days.'

On the other hand, congruent lexicalization occurs when a given statement with a grammatical structure that is common to both languages can be filled with the lexicon of either of them. Muysken (1997) illustrates code-switching of this type as follows:

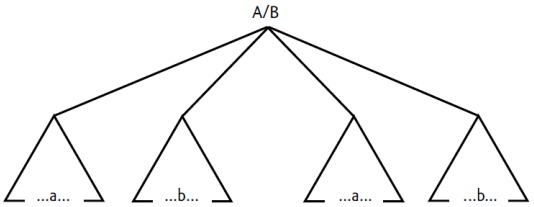


Figure 2.3: Congruent lexicalization (Muysken, 1997: 363)

See examples of congruent lexicalization in (9) and (10):

(9) *Bueno*, in other words, *el* flight *que sale de* Chicago round three o'clock. (English-Spanish, Pfaff, 1979)

'So, in other words, the flight that is leaving Chicago round three o'clock.'

(10) wan heri *gedeelte* de ondro *beheer* fu *gewapende machten*. (Dutch–Sranan, Muysken, 1997)

'One whole part is under control of the armed forces.'

Since the two languages in congruent lexicalization share a common grammatical structure, this type of CS is unlikely to produce grammatical violations when inserting lexical elements from either language. Language alternations of this sort have also been termed *composite matrix language* (Myers-Scotton, 1993).

In the next section we will turn briefly to an important problem, distinguishing between code-switching and borrowing.

2.2 Code-switching vs. borrowing

It is important to underline a distinction between CS and borrowing. Borrowing represents the insertion of "lexical material [from one language] to the morphological and syntactic (and usually phonological) patterns of the recipient language" (Poplack & Meechan, 1995: 200). Thus, the lexical items can be partially or wholly assimilated into the recipient language, as shown in (11) and (12) below:

(11) El *software* disponible es versión 2012. (English-Spanish, our own example)

'The available software is a 2012 version.'

(12) Si va a ir *shopping*, vaya con Mickey. (English-Spanish, Pfaff, 1979)

'If you're going to go shopping, go with Mickey.'

Moreover, borrowing represents an "umbrella term to refer to a variety of lexical level phenomena, ranging from the integrated loans that are structurally adopted and socially acceptable in monolingual speech, to loan shifts that extend the meanings of items in the adopting language, to the 'nonce' idiosyncratic transference of unassimilated items" (Anderson & Toribio, 2007: 218).

In some instances, borrowings become established and socially accepted loan words that serve to designate new concepts, objects, or ideas (Weinreich, 1953), as for example in colonization processes and in technology, as seen in (11). In some cases, the lexical borrowings are used even if the terms have an equivalent translatable word, as in (12), where *shopping* is equivalent to *ir de compras* in Spanish. Although speakers may

be aware of their use of borrowings, they prefer to employ the borrowing due to emotional, pragmatic, or semantic associations and emphasis, among other reasons. In all of the cases, speakers' original choice to borrow a word may be a conscious and deliberate action (Lipski, 2005).

Borrowing occurs more often in some categories than in others (Haugen, 1953; Muysken, 2000). Indeed, nous and adjectives are more easily borrowed than pronouns and conjunctions. Furthermore, within each category there are items that are better candidates for borrowing than others. As underlined by Anderson and Toribio (2007) borrowing is more likely to be used for "words that have a highly specific referential meaning, and whose cross-linguistic equivalents, where they exist, conjure up quite different connotations" (Anderson & Toribio, 2007: 220). Conversely, core words such as for example *house* or *bed* are less likely to be borrowed since they have more straightforward equivalents across languages. Borrowing is going to be more evident for words that have a precise referential meaning and even if sometimes they have a translation in the host language, the word does not accurately reflect the same connotation.

The amount and type of borrowings is context related for example "in circumstances of immigrant or subordinate bilingualism, lexical borrowing is more pronounced, and the domains in which borrowing is likely to occur depend on social aspects of the contact situation" (Anderson & Toribio, 2007: 218). As explained earlier, borrowing implies different levels of phonological and/or morphosyntactic adaptation of lexical and structural items from one language into another. On the other hand, code-

switching denotes language shifting with no alteration of the linguistic properties (Pfaff, 1979; Poplack and Meechan, 1995; Muysken, 2000). Both phenomena, borrowing and code-switching, have different characteristics and obey different constraints as shown in examples (13) and (14):

(13) a. Je vais faire *checker* ma voiture. (French, Harding-Esch & Riley, 2003)
'I'm going to have my car checked.'

b. Las *brecas* de la *troca* no trabajan. (Spanish, Di Paolo & Spears, 2004)
'The brakes of the truck don't work.'

(14) a. Las palabras *heavy-duty* bien grandes se me han olvidado (Spanish-English, Poplack, 1980)
'I've forgotten the real big, heavy-duty words.'

b. *J'ai acheté an American car*. (French-English, Cook, 2003)

'I bought an American car.'

When words are inserted through a borrowing process, they undergo syntactic, phonological, and morphological adaptations that make them become part of the host language to the point that monolingual speakers use them sometimes ignoring their foreign origins as shown in (13). As seen above (13a) the words *checker* 'to check', (13b) *brecas* 'brakes', and *troca* 'truck' do not constitute English code-switched terms since the verb to check, and the nouns brakes and truck have been adapted to the phonology, the morphology, and the syntax of (14a) French and (14b) Spanish. By contrast, examples in

(14) show code-switched words within the Spanish and French utterances since the terms *heavy-duty* and *American car* preserve the English phonological and morphological patterns.

Grosjean (2010) illustrates the contrast between borrowing and code-switching in the following graph. The two cases can be distinguished by examining structural properties criteria:

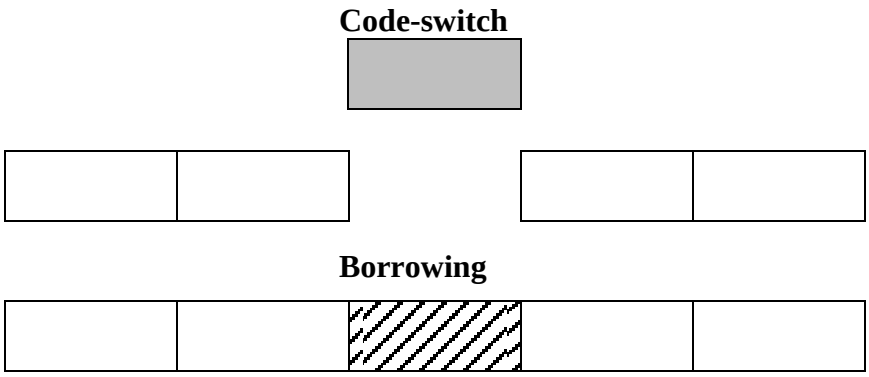


Figure 2.4: Illustration of the difference between a code-switch (the alternate use of two languages) and a borrowing (the integration of one language into the other (Grosjean, 2010: 58)

The division between code-switching and borrowing is based on the degree of integration of the switched word or segment. Figure 2.5 highlights language switching as an alternation of two languages in the same speech whereas borrowing involves the integration of one language's elements into the other at one or many levels. It is important to say also that depending on the frequency of occurrence, a word might be at

first code-switched and as its use rate increases and it is socially accepted, the same word might later turn into a borrowing.

In addressing the distinction between CS and borrowing, Poplack (1980) asserts that the two correspond to different mechanisms based on the type of integration onto the base language. Poplack characterizes four possible levels of integration as shown in Figure 2.6:

Type	Levels of Integration Into Base Language			CS?	Example
	phon	morph	syn		
1	✓	✓	✓	No	Es posible que te MOGUEEN. (They might mug you.) (002/1)
2	–	–	✓	Yes	Las palabras HEAVY-DUTY, bien grandes, se me han olvidado. (I've forgotten the real big, heavy-duty words.) (40/485)
3	✓	–	–	Yes	[da 'wari se] (58/100)
4	–	–	–	Yes	No creo que son FIFTY-DOLLAR SUEDE ONES. (I don't think they're fifty-dollar suede ones.) (05/271)

Figure 2.5: Code-switching according to type of integration into the base language (Poplack, 1980: 584)

Therefore, elements in the Type 1 category constitute cases of borrowing since they have been integrated at all the levels. Items that only show syntactic integration, Type 2; phonological integration, Type 3; or no integration at all as in Type 4 are considered cases of code-switching.

There is some disagreement with respect to considering integration as a decisive factor in distinguishing code-switching from borrowing. According to Myers-Scotton (1993a) there are two categories of borrowings: cultural borrowings, items that are new to the recipient language culture; and core borrowings which involve elements that already have a term in the language. Thus, borrowing may be motivated by sociolinguistic factors that prompt speakers prefer to use core borrowings rather than the existing language terms. The non-integration of the term conveys a symbolic value (Bourdieu, 1991) which allows speakers communicate the social prestige associated with the language from which the term is borrowed. Hence, Myers-Scotton (1993) questions whether it is necessary to distinguish between the two ideas and considers any case of word insertion and segment alternation as forms of code-switching regardless the level of integration. Under this view, code-switching and borrowing shape a continuum of related processes.

2.3 The study of code-switching

Prior to the 1970s, scholars were interested in researching language contact phenomena such as linguistic interference and borrowing (Bloomfield, 1933; Haugen, 1950a, 1950b; Weinreich, 1953). They paid little attention to CS. To illustrate, Haugen (1950a) addresses different instances of language contact phenomena, with no explicit mention of the concept of CS, Haugen (1950b) presents a historical analysis of the linguistic phenomena of borrowing, arguing that the outcome of language contact depends on speakers' proficiency and abilities to reproduce linguistic elements. Another major study on language contact, Weinreich (1963), presents a thorough examination of the structural causes of interference but does not address the phenomenon of CS.

Early explanations reinforced the view of language alternation as an unsystematic behavior and as a second-rate communication strategy common among bilingual speakers who were unable to separate languages and maintain a conversation exclusively in one of them. Haugen (1950a) points out that "the introduction of elements from one language into the other means merely an alteration of the second language [...] it also suggests a jumbling of a more or less haphazard nature" (211). Unfortunately, the idea of language alternation was therefore defined in terms of disordered and unsystematic mixture of languages. Along the same lines, Weinreich's influential work *Languages in Contact* (1953) provides a rather simplistic explanation about language switching as a transfer of words from one language to another as a result of speakers' "oversight" (73) in communication. Strangely enough, the in-depth research on the process and principles behind borrowing phenomena gradually led researchers to notice that CS was more than speakers' lapses of language ability.

After the publication of the ground-breaking studies of Pfaff (1979) and Poplack (1980), researchers became increasingly interested in demonstrating that CS is a socially meaningful, systematic, and natural outcome in bilingual and multilingual language settings rather than a random behavior. Over the years, linguists have examined CS from two main angles: structural and sociolinguistic perspectives. In the end, both viewpoints aim to learn more about the meaning, socio-pragmatic functions, and patterns of CS.

On the one hand, researchers who use a sociolinguistic approach have inquired about the socio-pragmatic and psychological characteristics, behaviors, and motivations that determine both the code-switched input and output in bilingual or migrant

communities (Valdés-Fallis, 1976; McClure, 1981; Gumperz, 1982; Zentella, 1997; Montes-Alcalá, 2000). There are certain social, political, and discursive conditions that prompt individuals to switch between languages, for example Spanish-English contact in the United States in communities such as Miami and New York.

Besides being an identity marker, CS also serves numerous discourse functions (e.g., quotation, specification, interjections, reiteration, and message qualification) (Gumperz, 1982). CS allows a myriad of bilingual conversation strategies for bilingual communities. In her research on the Puerto Rican bilinguals in New York, Zentella (1997) observed around 21 different conversational categories for the use of CS. Speakers switched between English and Spanish for stylistic purposes and situational demands, from filling lexical gaps to rearranging conversation through narratives and shifting roles. The ethno-linguistic research of Zentella (1981, 1997) emphasizes CS complexity and systematicity for serving particular functions.

On the other hand, from the grammatical approach, researchers have attempted to formulate universal syntactic constraints in code-switching production (Weinreich, 1953; Pfaff, 1979; Poplack, 1980; Sankoff & Poplack, 1981; Lipski, 1982, Joshi, 1985, DiSciullo, Muysken, & Singh, 1986; Mahootian, 1993; Belazi, Rubin, & Toribio, 1994; Myers-Scotton, 1993, 1997; Toribio, 2001a, 2001b; MacSwan, 1999, 2000, 2005, 2010, 2013, 2014; among others). In particular, researchers have questioned how bilinguals differ from monolinguals in the way their languages are internalized and what types of rules underlie language switching patterns. Besides the specific syntactic restrictions, researchers strive to understand who can acquire the rules behind CS and how the

acquisition process is for early bilinguals, heritage speakers who learned the two languages simultaneously or sequentially with some degree of attrition in childhood, and/or late bilinguals or second language learners.

Structural research of CS patterns and behaviors has shown that CS is far from being a linguistic phenomenon in which bilingual speakers simply arbitrarily mix two languages. Researchers agree that language switching is instead a rule-governed and systematic behavior. Some of the main structural explanations of code-switching are found in Timm (1975), Pfaff (1979), Poplack (1980), Sankoff & Poplack (1981), Woolford (1983), Di Sciullo, Muysken & Singh (1986), Belazi, Rubin, & Toribio (1994), Myers-Scotton (1997), Toribio (2001a, 2001b), and MacSwan (1999, 2000, 2005).

Moreover, these scholars agree that there are certain switches that are systematically favored over others based on experiments using a variety of methods to test structural constraints, e.g., naturalistic elicitation, comprehension and grammaticality judgment tasks, matched guise tasks, language attitude surveys, reaction time tasks, controlled and naturalistic language activities (reading task, recounting task, and writing), and elicited repetition/imitation tasks. These scholars have demonstrated that CS is either allowed or forbidden at some particular places or boundaries in the sentence depending on particular syntactic constraints. The ensuing discussion addresses the constraints that have been proposed for code-switching and that are relevant to our present purposes.

Since this dissertation is concerned with the syntactic constraints of code-switching, what follows is an account of the particular constraints related to grammaticality in code-switching. Therefore, we will now review Pfaff's (1979) earlier

account on code-switching, Poplack's (1980) and Sankoff & Poplack's (1981) linear constraints, Di Sciullo, Muysken & Singh's (1986) Government Constraint, Belazi et al's (1994) hierarchical approach to code-switching, and MacSwan's (1999) account on code-switching from a Minimalist point of view.

2.4 Constraints on code-switching

2.4.1 Pfaff (1979)

Pfaff evaluated a large corpus of conversational data from approximately 200 bilingual speakers of various ages and social backgrounds. Following quantitative analysis of the Spanish-English mixed data, the author took into account "(1) the point of onset of the mix, (2) the syntactic structure or constituency of the mix, and (3) the duration of the mix" (Pfaff, 1979: 295). Based on these aspects, Pfaff proposed four major constraints for CS that are related to functional, structural, semantic, and discourse aspects, as well as some structural triggers that prompt speakers to shift codes in their discourse.

The first constraint refers to functional limitations in mixing English verbs in Spanish contexts (15) and (16),

(15) Estaba *training* para pelear. (Spanish-English, Pfaff, 1979)
'He was training to fight.'

(16) ¿Dónde estás *teaching*? (Spanish-English, Pfaff, 1979)
'Where are you teaching?'

The un-adapted verbs (15) *training* and (16) *teaching* are allowed since tense/mood/aspect and subject are marked in the Spanish verbs (15) *estaba* and (16) *estás*; i.e., a verb shift is allowed as long as the main verb in the sentence is an inflected verb as in the Spanish example.

A second constraint, the structural constraint, states that code-switches tend to occur when the linear structure of the two languages overlap (17, 18):

(17) El *flight* que sale de Chicago. (Spanish-English, Pfaff, 1979)
'The flight which leaves from Chicago.'

(18) *I went to the house *chiquita.* (Spanish-English, Pfaff, 1979)[1]
'I went to the little house.'

In the examples above the language switch (17) between the determiner *el* and the noun *flight* raise no grammatical conflict because the syntactical structure is the same in both languages. In contrast, the structure in (18) is not common in both languages, therefore the sentence is ungrammatical. Indeed, in general, the adjective follows the noun in Spanish whereas in English the noun is preceded by the adjective.

For the third constraint, the semantic constraint, the author writes "whole PP switches involve figurative or temporal meanings; literal locatives switch after the preposition" (Pfaff, 1979: 314).

(19) Bueno, in other words, el flight que sale de Chicago *around three o'clock.*
(Spanish-English, Pfaff, 1979)

[1] Hereafter, examples preceded by a * represent an ungrammatical switch.

‘Fine ... the flight which leaves from Chicago around three o'clock.’

(20) Lo puso *under arrest* (Spanish-English, Pfaff, 1979)

‘He put him under arrest.’

(21) Todos los fondos que requieran para operar la escuela son *under your balanced budget.* (Spanish-English, Pfaff, 1979)

‘All the funds which they require to operate the school are under your balanced budget.’

Prepositional phrases in Spanish and in English have a similar structure. However, as explained by Pfaff, not all structurally possible switches are equally probable since there are some semantic constraints. In (19-21) the prepositional phrases correspond to idiomatic phrases and the prepositions have a temporal or figurative sense. According to Pfaff, such semantic aspects cause the preposition to be the beginning of the switch, i.e. to be the head of the language switching.

On the other hand, the examples (22-24) below illustrate switches in sentences involving literal locatives:

(22) tiendas de *retail*. (Spanish-English, Pfaff, 1979)

‘retail stores.’

(23) Con el *bat*. (Spanish-English, Pfaff, 1979)

‘with the bat.’

(24) Fuimos del *airport*. (Spanish-English, Pfaff, 1979)

'We went from the airport.'

Since the prepositions express literal locative and instrumental senses, the switch takes place after the preposition, which appears in Spanish. These differences led Pfaff to the conclusion that, although prepositional sentences in both English and Spanish have similar structures, not all structurally possible switches are allowed.

In her study, the author concludes that "it is unnecessary to posit the existence of a third grammar to account for the utterances in which the languages are mixed; rather, the grammars of Spanish and English are meshed according to a number of constraints" (Pfaff, 1979: 314). Therefore, she questions the necessity of defining a particular grammar for code-switching and therefore bilinguals only need grammatical knowledge of their two languages to create syntactically acceptable code-switched utterances.

Although Pfaff's approach offers an interesting and comprehensive description of Spanish-English code-switching, it fails to take into account other switch cases that can arise in code-switching between typologically different languages.

2.4.2 Poplack (1980)

Further studies about the structural constraints that govern the interaction of two languages were presented by Poplack (1980) and Sankoff & Poplack (1981). Specifically, Poplack (1980) addressed the grammar of code-switching in the context of Spanish-English use in a Puerto Rican community in New York. Employing

methodologies such as ethnographic observation and naturalistic recordings, the author recorded a series of conversations in informal social gatherings and conducted individual sociolinguistic interviews with her subjects. Poplack found particular patterns of code-switching. She stressed the importance of word order equivalency in code-switching production, and proposed the Equivalence Constraint and the Free Morpheme Constraint, two of the best known code-switching constraints.

On the one hand, the Equivalence constraint states that code-switching is allowed only when both structures are equivalent:

(25) **The Equivalence Constraint**

> Codes will tend to be switched at points where the surface structures of the languages map onto each other. (Poplack, 1980: 586)

That is to say, switches are expected to occur within constituents whenever the word orders of both languages converge. The Equivalence Constraint in (25) correctly predicts the ungrammaticality of examples such as *car *rojo* and *carro *red* / car red 'red car'. In both cases the code-switch cannot occur since they do not follow the word order requirements of the languages involved (see also Di Sciullo et al., 1986).

The Free Morpheme Constraint predicts no switches between a free and a bound morpheme:

(26) **The Free Morpheme Constraint**

> Codes may be switched after any constituent in discourse provided that constituent is not a bound morpheme. (Poplack, 1980: 585)

An example of a code-switch at the boundary of a bound morpheme such as **eat-iendo* 'eating' corresponds to an infelicitous switch, which consists of a Spanish bound morpheme *iendo* ('-ing') affixed to the English stem *eat*. Accordingly, these types of switches are only possible in cases of borrowing in which one of the morphemes has been integrated phonologically into the language of the other. Further, Poplack (1980) found that all the code-switches in the corpus were grammatical regardless of speakers' bilingual abilities.

Likewise, all her participants, including those less fluent bilinguals, produced code-switches that followed the equivalence constraint. Now, depending on their bilingual ability and age of immigration, participants exhibited specific preference patterns in code-switching. Spanish-dominant speakers tended to produce more tag switches using idiomatic expressions, interjections, fillers, among others. In contrast, balanced bilinguals tended to switch intrasententially whereas less fluent bilinguals produced more intersentential switches.

Poplack explains that differences in the type of code-switching produced according to individual's bilingual abilities are due to the speakers' proficiency, i.e. knowledge of the two language systems. Because of their advanced knowledge of the two language structures, only balanced bilinguals would prefer to use intrasentential code-switching, the more complex type of language alternation. At the same time, proficiency and code-switching production are correlated to age of acquisition. Intrasentential code-switches were mainly produced by the subjects who learned English in the early childhood and in a smaller proportion by individuals who acquired English

during the preadolescence. Participants who learnt English after adolescence rarely alternated languages at the intrasentential level.

Although Poplack's constraints are ground-breaking, they suffer from some limitations. One major drawback of Poplack's Equivalence Constraint is that its formulation is in terms of linear order and not of structural relations. As Di Sciullo et al. (1986) state: "most principles of grammar are formulated in terms of hierarchical relations [...], it would be necessary from the point of view of the theory of grammar that constraints on code-mixing are structural rather than linear" (3).

Another criticism of Poplack's Free Morpheme Constraint and Equivalence Constraints is that they may allow certain code-switched constructions even when they result in ungrammaticality. In this regard, Belazi, Rubin and Toribio note that Poplack's constraints "go a long way toward accounting for the attested patterns of code-switching, but they are insufficiently restrictive, even when they are operating in conjunction, and thus allow a grammar to over generate" (Belazi et al., 1994: 227). In the case of the Free Morpheme Constraint, it is predicted that that code-switching cannot occur with a bound morpheme. Nonetheless, as highlighted by Belazi et al. (1994), the constraint does not explain why, as in the case of bound morphemes, there are certain free morphemes that cannot be switched either, as shown in (27a) and (27b):

(27) a. * *Los estudiantes han* elected a new representative. (Spanish-English, Toribio, 2001a)

'The students had elected a new representative.'

b. * Five of my cousins have *completado estudios universitarios*. (English-Spanish, Toribio, 2001a)

'Five of my cousins have completed university studies.'

According to the free morpheme constraint, the above sentences would be grammatical constructions. Nevertheless, these constructions are unacceptable, as are the following:

(28) a. **The professor said that* el estudiante habia recibido una A. (English-Spanish, Belazi et al., 1994)

'The professor said that the student had received an A.'

b. **El profesor dijo que* the student had received an A. (Spanish-English, Belazi et al., 1994)

'The professor said that the student had received an A.'

Both sentences in (28) share structure in English and Spanish, again showing that both the Free Morpheme Constraint and the Equivalence Constraint have serious limitations in that they fail to account for many instances of ungrammaticality in CS.

Despite the critiques to Poplack's constraints, they have laid a strong groundwork for structural CS study as they continue to be major contributions to the area. From the previous discussion, it can be seen that Poplack's (1980) investigation represents a pioneer attempt to invalidate underlying misconceptions about code-switching as an indicator of deficient linguistic competence on the part of bilingual speakers. As Poplack states: "code-switching is a verbal skill requiring a large degree of competence in more than one language, rather than a defect arising from insufficient knowledge of one or the

other" (1980: 72). Given this conclusion, it is widely accepted that code-switching represents a rule-governed phenomenon and a skill that demonstrates advanced proficiency in a bilingual speaker. The considerable amount of literature on code-switching that has been published points to the complexity that the code-switching phenomenon entails.

The next section describes and discusses a non-linear approach to code-switching, the Functional Head Constraint (Belazi et al., 1994).

2.4.3 Di Sciullo, Muysken, & Singh (1986)

More recently, code-switching has been studied in the frame of Chomsky's Principles and Parameters theory and some of the main non-linear approaches to language shifting have been proposed by Di Sciullo, Muysken and Singh (1986), and Belazi, Rubin and Toribio (1994), among others.

Di Sciullo et al. (1986) based their code-switching theory on the syntactic theory of Government and Binding proposed by Chomsky (1981). The authors examined two corpuses of French-Italian and English-Italian code-mixing data in Montreal and Hindi-English code-mixing in urban North India. Di Sciullo et al. proposed that code-switching is problematic at the S-structure because of the government relation that exists between sentence constituents. Below, the authors' definitions of *Government* and *Government Constraint*:

(29) **Government**

X governs Y if the first node dominating X also dominates Y, where X is a major category N,V,A,P and no maximal boundary intervenes between X and Y. (Di Sciullo et al., 1986: 6)

(30) **Government Constraint**

a. If Lq carrier has index q, then Yq-max

b. In a maximal projection Ymax, the Lq carrier is the lexical element that asymmetrically c-commands the other lexical elements or terminal phrase nodes dominated by Ymax. (Di Sciullo et al., 1986: 6)

Therefore, the relation between a head and its syntactic environment determines code-switching. On the one hand, the constraint predicts that if X has language index q, X governs Y, and Y is a maximal projection with a single lexical item, in that case Y must also have language index q. An example of code-switch predicted impossible may be the prepositional phrase *para escribir 'to write'*. In this case X would be the preposition *para* that governs Y, the NP. Since the Y is filled with the lexical element *escribir*, both the preposition and the NP must have the same language index.

On the other hand, if X has language index q and governs Y, and Y has more than one lexical element, the language index of the highest element in Y must also hold language index q. For example, in the phrase *to the school*, the determiner *the* is the highest lexical element within the governed NP. Thus, the determiner and the verb need to have the same language index and the noun *school* may be produced in the same or in a different language. Additionally, ungoverned items such as exclamations, interjections, tags, among others can be easily switched.

Although the Government Constraint goes beyond word order equivalency to explain code-switching, it makes some incorrect predictions. (31a) and (31b) show some of the counter-examples highlighted by MacSwan (1999):

(31) a. This morning *mi hermano y yo fuimos a comprar* some milk. (English-Spanish, MacSwan, 1999)
'This morning my brother and I went to buy some milk.'

b. J'ai joué avec *il-ku:ra*. (French-Arabic, MacSwan, 1999: 44)
'I have played with the ball.'

As previously explained, the government relation between a verb and its object and between a preposition and its object predicts that a verb or a preposition must be in the language of its complement. Nevertheless, (31a) and (31b) contradict the Government Constraint and yet they are possible and accepted. MacSwan (1999) states another major criticism against the government constraint as it appeals to an independently motivated principle of grammar. Since the government relation is inoperative (invalid) and should not be considered in grammatical theory (Chomsky, 1995) and since government is not independently needed for monolingual speech, MacSwan (1999) rejects Di Sciullo et al. (1986) constraint because it appeals to the idea of a third grammar for code-switching. MacSwan's approach to code-switching will be further discussed in section 2.4.5.

2.4.4 Belazi, Rubin, & Toribio (1994) - The Functional Head Constraint

Before proceeding to examine Belazi et al.'s (1994) ideas, this section reviews Chomsky's (1991) concept that functional heads check morphological features of the elements in their Checking Domain. The basic premises of the Universal Grammar theory and the Government and Binding Theory are that all humans have a language-learning mechanism called universal grammar. All languages share common categories

and rules and whenever a language diverges from the premises of the universal grammar, it is considered an exception.

With this in mind, Chomsky proposes the following scheme, Figure 2.6, to represent the components of language and grammar:

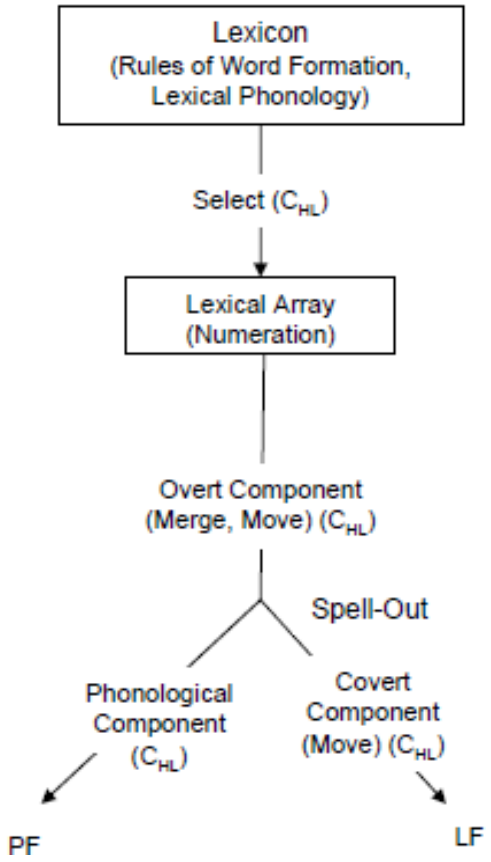


Figure 2.6: The Minimalist framework (MacSwan, 2000: 44)

The lexicon represents the characteristic properties of lexical items which constitute syntax. The lexical items are mixed at D-structure (underlying structure) and then into the S-structure, the syntactic representation that shows the surface order of the sentence. In the next interfaces, the items take the Phonological Form (PF) and Logical

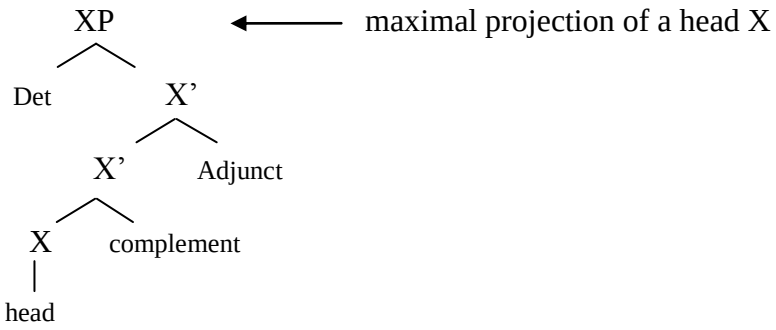
Form (LF). The PF interface involves the phonology, sounds, and groupings of items whereas the LF interface comprises the Semantics.

Moreover, at the lexicon interface, words are divided into functional and lexical categories. The first category, the functional categories are generally closed-class words. These items have a strictly grammatical function and generally cannot have new members added. Examples of functional items are articles [e.g., the, a/an, etc.], conjunctions [e.g., and, or, etc.], quantifiers [e.g., any, few, etc.], among others. On the other hand, the lexical words include elements such as nouns, adjectives, verbs, and prepositions. In structural terms, they are open-class items that are called heads and they form phrases with the same lexical category: Noun Phrase (NP), Verbal Phrase (VP), Adjectival Phrase (AdjP), and Prepositional Phrase (PrepP).

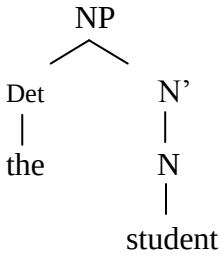
In such cases, the head selects a particular complement that can combine with, to form a phrase. In this sense, a complement denotes a phrase that a lexical category takes or selects. For example, verbs have properties that will determine which complement is to be taken. The verb *to say* can take one or two PrepP complements where the prepositions are *to* and *about* while the verb *to die* cannot take any complement. The verb *to live* can take a PrepP with *in* as the preposition and *to read* must take a NP complement, *a book*. Besides heads and complements, there can be other parts in the phrases called specifiers. For example, AdjP can be preceded by words such as *quite* and *very* while NP might have in front words or phrases such as *every*, *the*, *your friend's*.

It is also worth noting that the above items and categories might be structurally represented with the X-bar theory, a method of sentence analysis. Based on the premise that all human languages share certain structural similarities, the X-bar theory (Chomsky,

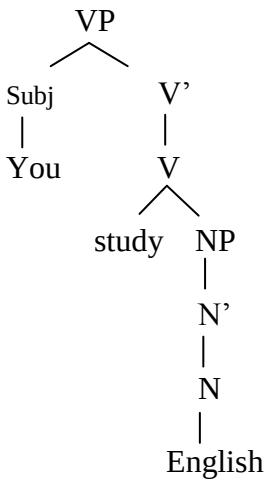
1970) states that languages share the same underlying syntactic structure known as the "X-bar". It posits that any sentence may be analyzed into major parts that are divided into smaller parts until each constituent is composed of a single word. The graphic representation depicts a hierarchical structure of the relationship between the elements of the sentence. For example:



The rules for the analysis are recursive. The analysis commences with a generic XP structure and from there an infinite number of possible structures might be generated. To illustrate, the determiner phrase *the student* might be represented as follows:



The determiner is the article *the*, a type of specifier for nouns. The head is the determiner (D) which projects a determiner phrase (DetP). The above phrase has not adjuncts or complements. The verbal phrase *you study English* is represented as below:



Correspondingly to the previous example, in this case the head of the sentence is the verb *study* which projects a VP.

Now, bearing in mind the previous points, Belazi et al. (1994) examined a corpus of Tunisian Arabic-French and Spanish-English code-switching data and proposed the Functional Head Constraint (FHC). The participants in the study were balanced bilinguals and data was collected by eliciting grammaticality judgments compared to natural conversation data. The authors ground their analysis in two main theoretical premises: (a) the notion of feature checking posited by Chomsky (1993) in the frame of the Minimalist Program and (b) Abney's (1987) theory of 'f-selection'. The f-selection is part of the feature-checking process that predicts that the semantic and syntactic features of a functional head must match those of its complement. Belazi et al. include language indexing in the f-selection, i.e. language is one of the features being checked in code-switching.

The FHC draws on Chomsky's (1993, 1995) concept of feature checking to determine under which conditions intrasentential CS is possible. Specifically, Belazi et al. (1994) examined Tunisian Arabic-French and Spanish-English intrasentential CS to propose the Functional Head Constraint which is based on the distinction between functional and lexical heads. The functional head constraint is summarized in (32).

(32) ***The Functional Head Constraint***

> The language feature of the complement f-selected by a functional head, like all other relevant features, must match the corresponding feature of that functional head. (Belazi et al., 1994: 228)

Consequently, a functional head (i.e. Determiner, Inflection, Complementizer, Quantifier and Negation) f-selects its complement and therefore severely restricts the types of possible complements that can appear (e.g. Noun Phrase, Verb Phrase, Inflection Phrase). In other words, the features of the functional head and its complement must match. This is not the case for lexical items such as verbs and nouns and their complements. The FHC thus precludes switches between the following functional heads and their complements:

Determiners (D)	and	the noun phrase (NP)
Negative heads (Neg)	and	the verb phrase (VP)
Quantifiers (Q)	and	the noun phrase (NP)
Complementizers (C)	and	inflected clausal complements
Auxiliaries (AUX)/Inflexion (INFL)	and	the verb phrase (VP)

Consider (27a) and (b), repeated here as (33a) and (b),

(33) a. * *Los estudiantes han* elected a new representative. (Spanish-English, Toribio, 2001a)

'The students had elected a new representative.'

b.* Five of my cousins have *completado estudios universitarios*. (English-Spanish, Toribio, 2001a)

'Five of my cousins have completed university studies.'

In (33a) inflexion is realized by the auxiliary *haber*, which will be indexed as Spanish. The verb phrase, its complement, is, however, in English, leading to a feature clash, constituting a violation of the FHC and thus rendering the switch ungrammatical. The situation in (33b) is the opposite. The auxiliary is indexed as English *have*, while its complement is in Spanish. Again, the result is ungrammaticality. Compare these sentences with (34a) and (34b).

(34) a. *Varios de mis estudiantes* arrived late for Thursday's lecture. (Spanish-English, Toribio, 2001a)

'Several of my students arrived late for Thursday's lecture.'

b. Several of my students *llegaron tarde a la conferencia del jueves*. (Spanish-English, Toribio, 2001a)

'Several of my students arrived late for Thursday's lecture.'

Because the switch takes place between the subject and the verb, a lexical category in both these sentences, the fact that the language does not match has no effect on grammaticality.

In addition, the FHC also proposes a language index, as a feature in the bilingual lexicon that indicates the language to which each word belongs (but see MacSwan, 1999; 2000, for arguments against a language index). As feature matching is a requirement of functional heads, switching between a functional head and its complement is ruled out, unlike switching between a lexical category and its complement. In monolingual speech the language feature of a complement matches by default the language feature of functional head but that in code-switching this checking process becomes apparent because of the language alternation.

Along with the FHC constraint stated in (32) above, Belazi et al. (1994) then propose the Word-Grammar Integrity Corollary (WGIC) (35).

(35) **Word-Grammar Integrity Corollary**

> A word of Language X, with Grammar G_X, must obey Grammar G_X. (Belazi et al., 1994: 232)

According to Belazi et al, the validity of this Corollary is based on the assumption that lexical entries are associated with morphological and syntactic features specific to each language (see Chomsky, 1993, 1995). Consider the following instances from Spanish-English code-switching:

(36) a. **la mujer* proud (Spanish-English, Belazi et al., 1994)
the woman proud
'the proud woman'

b. *La mujer* proud of her position (Spanish-English, Belazi et al., 1994)
'the woman proud of her position'

(37) a. *the woman *orgullosa* (Spanish-English, Belazi et al., 1994)
the woman proud
'the proud woman'

b. the woman *orgullosa de su puesto* (Spanish-English, Belazi et al., 1994)
'the woman proud of her position'

Example (36a) is deemed to be ungrammatical by the WGIC because in *proud* the grammar of English is not satisfied by using a post-nominal adjective unless it is followed by a complement to the adjective. In (36b) this requirement is met and the code-switch is grammatical. In (37a) the noun *woman* needs to be modified by an adjective to its left and for that reason the grammar of English is once again not satisfied, but it is in (37b).

In (38) we find another example of language index mismatch,

(38) *Two *libros* (English-Spanish)
'Two books'

The phrase in (38) is ungrammatical since switching within the quantifier phrase is not allowed. The language indexing feature is violated since the Quantifier *Two* carries

the language feature [+English] and the noun *libros* 'books' has the language feature [+Spanish].

To summarize so far, the FHC is language independent and predicts that code-switches between a lexical head and its complement naturally occur while switches between a functional head and its complement violate general principles and result in unacceptability.

Although the FHC continues to be a significant structural and theoretical explanation for CS, this approach is not uncontroversial. Dussias (2003) points out that some of the predictions of the FHC are not necessarily realized in the grammar of speakers.

According to the FHC, switches such as (40) and (42) are ungrammatical since they take place between the auxiliaries *haber* 'have' and *estar* 'be' and the VP complement.

(39) *El oficial piensa que los terroristas* have injured the man. (Spanish-English, Dussias, 2003)

'The officer thinks that the terrorists have injured the man.'

(40) **El oficial piensa que los terroristas han* injured the man. (Spanish-English, Dussias, 2003)

'The officer thinks that the terrorists have injured the man.'

(41) *El gobierno piensa que los ciudadanos* are supporting the war. (Spanish-English, Dussias, 2003)

'The government thinks that the citizens are supporting the war.'

(42) **El gobierno piensa que los ciudadanos están* supporting the war. (Spanish-English, Dussias, 2003)

'The government thinks that the citizens are supporting the war.'

In her study, Dussias examined the switches at the auxiliary/VP boundary by looking at the judgments and processing of a group of adult Spanish-English bilinguals (n=12) who regularly engaged in CS. To this end, the author carried out two tasks: a grammaticality judgment task and an eye-movement experiment to explore reading times in different types of Aux/VP switches.

Dussias (2003) found that participants took significantly less reading time in switches involving the auxiliary *haber* (39-40) in contrast to switches involving *estar* (41-42). The author concluded that English-Spanish bilingual speakers treat switches differently depending on the type of auxiliary used at the switch point, an aspect that is not predicted by the FHC. The results from both tests show that *estar* 'to be' + participle combinations appear not to be constrained by the same syntactic restrictions that disallow *haber* 'to have' + participle switching.

The author asserts that depending on the lexical items that fill the auxiliary item, switches at the auxiliary phrase are processed differently due to the degree of boundedness of the elements in the auxiliary phrase. There is a strong bond between *haber* + participle and therefore no element can appear between them plus *haber* can never occur by itself. It explains why the participants not only processed switches after *haber* more slowly than their corresponding control conditions, but also judged them as ungrammatical.

Conversely, the auxiliary *estar* appears to be more autonomous in its syntactic behavior. It can be followed by other expressions (e.g. adverbial and adjectival phrases:

estoy en el parque/ 'I am at the park'; *estoy molesto*/ 'I am angry', and the present participle: *estoy trabajando*/ 'I am working'). Thus, *estar* 'to be' + participle sequence is more easily separable. Such degree plays a role in the acceptability of a given CS construction. Similar results were found by Guzzardo Tamargo (2012)[2] in an eye-tracking experiment.

A tentative explanation for these results is that the two auxiliaries are not generated in the same position in the syntactic structure. The verb *haber* 'to have' has no semantic content and is simply a carrier for tense, aspect and agreement, and is thus generated high up in the structures (in TP). In contrast, *estar* is an auxiliary which is generated further down in the structure. Evidence for this comes from sentences such as *hemos estado preparando una paella* 'we have been preparing a *paella*' which is grammatical in Spanish, as is the equivalent in English. However, the opposite word order is not.

Since the Functional Head Constraint was first proposed, some authors have found contradictory evidence for it through switches in naturally occurring data

[2] Guzzardo Tamargo's (2012) eye-tracking experiment investigated the processing costs in Spanish-English switches by a group of early bilinguals. In this study, participants read code-switched sentences and answered comprehension questions. The findings from the fixation durations revealed that *estar*+English participle switches were processed more easily than the *haber*+English participle switches, even though the superficial similarities between the structures. These patterns are similar to natural bilingual production where *estar*+English participle switches are more frequent than *haber*+English participle switches.

(Mahootian and Santorini, 1996; MacSwan; 1997; and Nishimura, 1997). However, Toribio (2001a) challenges the accuracy of these reviews pointing out relevant methodological, empirical, and linguistic-theoretical problems with them. In approaching this issue, the ensuing discussion explores in detail the refutations made to the FHC.

Firstly, Mahootian and Santorini (1996) found several examples of switches in bilingual speech that have been incorrectly predicted as ungrammatical by the Functional Head Constraint. See (43a-e):

(43) a. I seen everything 'cause *no cogi na'*. (English-Spanish; Sankoff and Poplack, 1981)
'I saw everything because I didn't take anything.'

b. *Ye juri vanemud mikone ke* I'm stupid. (Farsi-English; Mahootian, 1993)
'He acts as if I'm stupid.'

c. *lorsque j'ai vu que* mabqas' (French-Moroccan Arabic; Bentahila & Davies, 1983)
'when I saw that there was nothing left'

d. No, parce que *hanno donne des cours.* (Italian-French; Di Sciullo, Muysken, and Singh, 1986)
'No, because they gave lectures.'

e. I'll take some *naemaek*. (English-Farsi; Mahootian,1993)
'I'll take some salt.'

Examples (43a-d) switches take place between the functional category Complementizer and its complement IP while (43e) the switch occurs between Quantifier and NP, which as previously explained are prohibited by the Functional Head Constraint.

Mahootian and Santorini (1996) assert that as can be noticed in the above clauses, the concept of language feature proposed by Belazi et al. (1994) as only visible in code-switching lacks validity. In response to the Functional Head Constraint inappropriate analysis, Mahootian and Santorini (1996) propose the Complement/Adjunct Distinction (CAD) as,

(44) **Complement/Adjunct Distinction**

Heads determine the syntactic properties of their complements in code-switching and monolingual contexts alike. (Mahootian and Santorini, 1996)

The CAD predicts, for example, that switches between a Determiner and its complement (45) represent a grammatical switch if the structure of the switched complement is what the Determiner might select in a monolingual DP.

(45) a. *dak* la chemise
that the shirt
'that shirt'

b. *wahed* le liquide
one the liquid
'some liquid'

c. *wahed* une cousine
one a cousin
'one cousin' (Bentahila & Davies, 1983: 69)

In (45a-c) the switch occurs between the functional head, the Determiner, and its complement. After finding several examples against the Functional Head Constraint,

Mahootian and Santorini conclude that it is not universal. However, in Belazi et al.'s (1994) study switches between a determiner and a noun correspond to a borrowing.

MacSwan (1997) also finds in his data occurrences of this type of code-switches. The author claims that English determiners often precede Spanish nouns. He gives the following example:

(46) The *borracho* who came to dinner yesterday se tomó toda la tequila. (English-Spanish, MacSwan, 1997)
'The drunk who came to dinner yesterday drank all the tequila.'

In this case, Toribio (2001a) argues that in the context of (46), the noun *borracho* 'drunk' represents a single noun insertion, instead of a switch. Thus, it is interpreted as a borrowed item rather than a switch. Other authors have cited switches between a determiner and its noun (47a-d) among many language pairs:

(47) a. Daban unos *steaks* tan sabrosos. (Spanish-English, Pfaff, 1979)
'They served some steaks so tasty.'

b. El *old man* está enojado. (Spanish-English, Gingras, 1974)
'The old man is mad.'

c. The white *casa.* (English-Spanish, Rivas, 1981)
'The white house.'

d. Se *hombre* kikoas se kalli. (Spanish-Nahualt, MacSwan, 2000)
'A man will buy a house.'

Regarding switches (47a-d) Belazi et al. (1994) acknowledge that it is possible to find such productions. However, they explain them as an outcome that depends on the degree of bilingual proficiency of the speaker. Toribio and Belazi (1993) explain:

> fluent [...] bilinguals are more sensitive to grammatical constraints on switching than their non-fluent counterparts. [...] the degree of bilingualism must be taken into consideration in any study of code-switching, as marginally competent bilinguals will demonstrate disparate behaviors in code-switching from more fully competent bilinguals. (7)

As previously discussed, balanced bilinguals tend to produce more intrasentential code-switches than subjects who are dominant in one language (Poplack, 1980). Thus, bilingual proficiency has an influence in the code-switching produced.

Furthermore, Toribio (2001a) argues that some of the counter examples to the FHC fail since they are based on natural occurring conversations which included topics ranging from politics, to relationships, to fashion, ethnicity and careers. Toribio explains that evidence found solely on naturalistic conversations entails methodological problems to make generalizations on CS since there is a distinction between speakers' competence and performance (Chomsky, 1965). *Competence* reflects our internal knowledge of language whereas *performance* represents the actual use of language in concrete situations. Our use of language does not accurately mirror our internal knowledge of language. For that reason, Toribio underlines the relevance of the distinction between competence and performance in the study of code-switching:

> This focus on natural code-switching data is incompatible with syntactic-theoretical modes of inquiry, since the absence of violations of deep principles in

> spontaneous utterances cannot be unequivocally credited to a constraint that exists on the speaker's grammar. (211)

In performance data, there is a lack of ungrammatical constructions. Researching speakers' code-switching performance throughout interviews, self-reporting, and naturalistic recordings alone may provide partial findings about their code-switching competence. In all of these methodologies, speakers' performance might be unnatural and influenced by the social status of code-switching, language attitudes, and/or by the presence of the researcher. Therefore, conclusions of studies based in performance data may not be generalized because of the absence of exceptions since, as acknowledged by Toribio, recordings of spontaneous speech need to be complemented by elicitation of speakers' beliefs about ungrammatical sentences.

Poplack maintains that differences in the type of code-switching produced according to individual's bilingual abilities are due to the speakers' proficiency, i.e. knowledge of the two language systems. Because of their advanced knowledge of the two language structures, only balanced bilinguals will prefer intrasentential code-switching, the more complex type of language alternation. At the same time, proficiency and code-switching production are correlated to age of acquisition. Recall that in Poplack's (1980) study, intrasentential switches are mainly produced by the subjects who learned English in the early childhood and in a smaller proportion by individuals who acquired English during the preadolescence. Participants who learnt English after adolescence rarely alternated languages at the intrasentential level. Supporting Toribio's (2001a) theoretical explanations, and relating these ideas to our working hypothesis, we

expected to find that competent and beginner L2 Spanish learners demonstrate dissimilar grammatical judgments on code-switched utterances.

The following section briefly presents the Minimalist approach to code-switching.

2.4.5 MacSwan (1999, 2000)

According to Chomsky (1995) all humans possess an innate computational system for human language (C_{HL}) that links sounds and meanings. The C_{HL} system has these basic operations: (a) *select*, an operation where elements are taken from the lexicon; (b) *merge*, an operation that creates structures by assembling these elements, and (c) *attract/move* operation transforms the structures formed by *merge*. The computational system of human language (CHL), Figure 6, interacts with external systems through two interface levels: the Phonetic Form (PF) and the Logical Form (LF). The a*ttract/move* operation is motivated by the necessity to eliminate uninterpretable features before the structure reaches the level of LF. The computational system is defined by economy principles, shortest and fewest steps are highest valued conditions, and primitive grammatical features may be different across languages.

Besides the C_{HL}, the Minimalist Program proposes another basic component: the lexicon. While the C_{HL} is assumed to be the same in all languages, the lexicon explains the idiosyncratic differences observed across languages. Therefore, Chomsky (1995) states that all of the language parameters and differences depend on the morphological properties of the lexicon.

The Minimalist framework shows how the construction of a sentence begins with the selection of lexical items from the lexicon at the *select* operation. Thus, the structure of the phrase always depends on the lexical properties of the language. Every element

possesses a set of features. Recall that as we explained in the previous section, there are two types of features: lexical categorical (LC) features and functional (F) features. The lexical categorical features include semantic features, categorical features like [± nominal] and [± verbal], and phonological features whereas functional features consist of morphological properties such as tense, case, and agreement. These features are interpreted at the two interface levels called the PF and the LF. In other words, after being combined, i.e. merge operation, items must be approved at the PF and LF levels.

The Minimalist approach to code-switching appeals to "morphologically-sensitive mechanisms motivated to account for grammaticality in monolingual sentences" (MacSwan 1999: 147). The author bases his arguments on two central components: a computational system that is the same across human languages, and a lexicon that is dissimilar across languages (MacSwan 1999, 2000, 2005). In this sense, differences among languages do not obey to syntactic aspects but are due to morphological realization features in the lexicon. Accordingly, MacSwan states "if all syntactic variation is associated with the lexicon, as in the Minimalist Program, then code-switching may be seen as the simple consequence of mixing two lexicons in the course of a derivation" (2000: 45).

Applying this to CS, MacSwan (2000) states that the same set of features are going to be checked against the features of the lexical switched items during sentence derivation. Therefore, depending on the lexicon to which the elements in the sentence belong to, the code-switched elements will be treated in the derivation according to the features related to them in their original language.

MacSwan applies the Minimalist Program mechanisms to CS using the same main three operations: first, the **Select** operation that "picks items from the lexicon and introduces them into the numeration, an assembled subset of the lexicon used to construct a derivation". Second, the **Merge** operation "takes items from the numeration and forms new, hierarchically arranged syntactic objects". In the third final stage, the operation **Move** "applies to syntactic objects formed by Merge to build new structures" (MacSwan, 2000: 43). Therefore, code-switched elements are going to be constrained by how the features of a given lexical item are checked at the Select, Merge and Move operations. In this sense, CS grammar depends on the language specific features of the lexical items of the languages involved in the switch.

Taking the Minimalist Program framework outlined above, MacSwan (1999, 2000) argues that it is unnecessary to formulate any grammatical principle for code-switching: "Nothing constraints code-switching apart from the requirements of the mixed grammars" (MacSwan, 1999:146). Therefore, from the Minimalist Program approach and based on Chomsky's syntax theory, MacSwan proposes that to explain code-switching it should not be necessary to use any apparatus other than that used to explain monolingual speech.

The key aspects of this argument are that the computational system is invariant across all languages and that parameters are part of the lexicon. Therefore, the Minimalist Program schema presented above in Figure 2.8, may illustrate the same process for code-switching. The computational system uses the lexicon to construct any structure. Lexical items in the structure have F-features, i.e. grammatical features, that are

derived and that need to be checked. According to MacSwan (1999: 148), the language faculty does not require to pay attention to the sociopolitical identity of words:

> Each lexical item introduces features into the derivation, and these features must be checked. […] The language faculty need pay no attention to the sociopolitical identity of word (our association of *tree* with "English" or of *árbol* with "Spanish"). It only knows that these lexical items have features which enter into derivation, and that these features must be checked; when features mismatch, when uninterpretable features cannot be checked, the derivation crashes, whether the set of lexical items is associated with one particular language or two (or more). Thus, in the minimalist program, a *conflict in language-specific requirements* is just a conflict involving lexical features and the interface of distinct "languages" is trivially solved. (MacSwan, 1999: 147)

MacSwan's approach clearly rejects CS constraint-oriented approaches (Fig. 2.7) such as Poplack's (1980) constraints and her principles of a "third grammar" for code-switching.

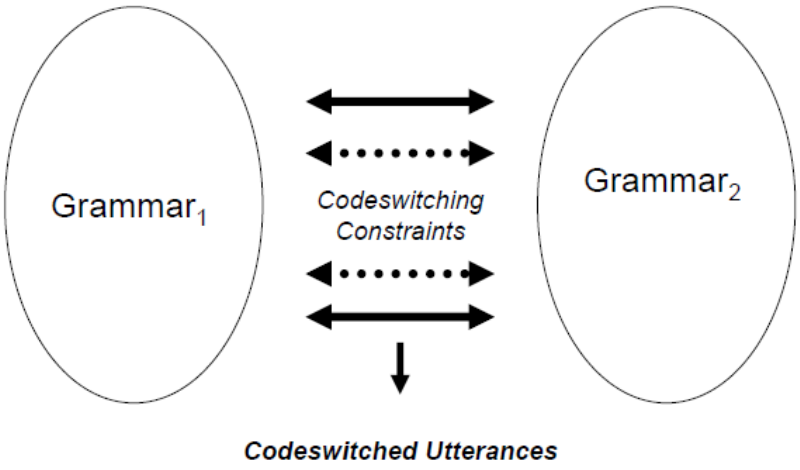


Figure 2.7: Constraint-oriented approaches (MacSwan, 2006)

Additionally, MacSwan challenges the FHC's proposal of language index checking since identities of particular languages are not considered in the Minimalist Program:

> It entails that we ignore the identities of particular languages for the purposes of linguistic theory. […] Hence, while distinctions like "Spanish", "French", "English" and "Berber" are meaningful for many interesting questions of language use, they do not enter into the apparatus of syntactic theory, and should play no role in an account of code-switching. […] clearly, however, there are language-particular requirements; in the minimalist program, these are assumed to be represented in morphology. (MacSwan, 2000: 146)

Therefore, the language-particular requirements of code-switching are in the morphology, i.e. in the lexicon. MacSwan (2000: 41) underlines that this approach invalidates Belazi et al's (1994) proposal that the language feature of the complement f-selected by a functional head must match the corresponding feature of that functional head. This idea requires a language feature such as [+Spanish] or [+Greek]. However,

according to MacSwan (2000) the "language feature" is not independently motivated for any other linguistic phenomenon and since it re-labels the descriptive facts, it is redundant.

In sum, the acceptability of a linguistic CS phrase depends on whether its features match, regardless of whether it is a monolingual or a code-switched expression. Since in the Minimalist Program syntactic variations are related to the lexicon, code-switching is "the simple consequence of mixing two lexicons in the course of a derivation" (MacSwan, 2000: 45). Therefore, opposed to Figure 8, Constraint-oriented approaches, this approach can be represented in Figure 2.8:

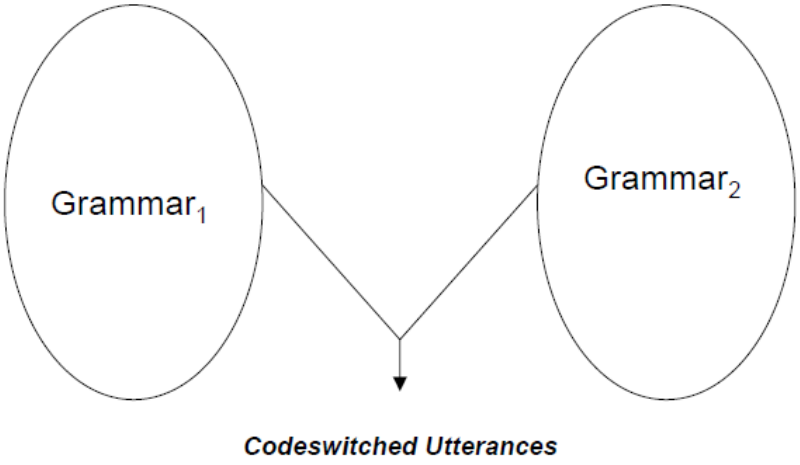


Figure 2.8: Constraint-free Approach (MacSwan, 2006)

Assuming this approach, code-switching is merely the result of mixing two lexicons, and therefore it is unnecessary to define specific constraints to explain conflicting conditions of ungrammatical CS. The mixing of the lexicons and the CHL may be enough to explain code-switching.

2.5 Code-switching and L2

Most of the work on the structural aspects and constraints of CS have examined bilinguals who have a relatively balanced proficiency in both languages in which they code-switch, i.e. speakers who acquired both languages from birth. Thus, few studies have specifically looked at the correlation between code-switching and foreign language speakers (but see Toribio, 2001a, 2001b; Anderson & Toribio, 2007; Giancaspro, 2013; Koronkiewicz, 2018).

In particular, Toribio (2001a) was the first to examine the issue of whether L1 English learners of Spanish exhibit knowledge of the structural constraints in CS based on the FHC (Belazi et al., 1994), that is, whether this knowledge is part of their bilingual grammatical competence.

In her study, Toribio (2001a) tested the acceptability judgments on CS in three groups of L1 English speakers with different levels of L2 Spanish who were students at the university level: (a) beginners (n=44) who were in the first semester at the time of testing, (b) intermediate learners (n=26) who were in the third semester and (c) advanced speakers (n=34) with at least 6 semesters of university study. The test administered consisted of a paired acceptability judgment task in which participants marked code-switched sentences as appropriate or inappropriate according to their intuitions.

Participants completed an Acceptability Judgment Task (AJT) that consisted on 22 pairs of code-switched sentences plus one practice sentence pair. The switches included as stimuli in the AJT were the following (Table 2.1):

Table 2.1: Code-switching types in Toribio's (2001a) AJT Ungrammatical switches (switching between functional elements and their complements)

CS boundary	Example
MOD/AUX (n=4)	**Los estudiantes han* elected a new representative. 'The students had elected a new representative.'
COMP (n=4)	*The clinic does not treat students that *no tienen seguro médico.* 'The clinic does not treat students that don't have medical insurance.'
NEG (n=4)	**La biblioteca normalmente no* opens on Sunday mornings. 'The library normally does not open on Sunday mornings.'
QUANT/NUM (n=4)	*On this campus many *estudiantes andan en bicicleta.* 'On this campus many students ride bicycles.'

Grammatical switches (switching between lexical elements and their complements)

CS boundary	Example
PREP (n=3)	*Los estudiantes presentaron la obra delante de* receptive audiences. 'The students presented the work in front of receptive audiences.'
NOUN (n=1)	Parents' encouragement *para sus hijos es muy importante.* 'Parents' encouragement of their children is very important.'
VERB (n=9)	The editor of the paper had written *un fuerte comentario.* 'The editor of the paper had written a strong commentary.'
ADJ (n=2)	The student proud *de sus éxitos celebraba en San Antonio.* 'The student proud of his accomplishments celebrated in San Antonio.'

Since we replicated Toribio's study with both L1 English and L1 French learners of Spanish, we used the same task used in the original study plus a French-Spanish CS version, as we will describe it more in detail in the methodology section. Toribio's (2001a) results showed that L2 proficiency level was strongly correlated with sensitivity to the CS restrictions proposed by the FHC. That is to say, advanced proficiency learners' responses were very accurate in their acceptance of grammatical CS sentences and rejection of ungrammatical ones. Intermediate learners' answers were more aligned with the results of the advanced group, while beginners had poor accuracy rates since they

tended to accept all switches involving word-for-word equivalency between Spanish and English. Toribio (2001a) concluded that CS competence in L2 learners develops hand in hand with their L2 proficiency. This in spite of the fact that, remarkably, L2 learners receive no in-class input on appropriate intersentential CS patterns.

Giancaspro (2013) also examined English-Spanish CS following the Constraint-Free (CF) approach (MacSwan 1999, 2014). Participants included two groups of bilinguals: 2L1 heritage bilinguals (n=25) and L2 Spanish learners (n=44). All of them were enrolled in upper-level, undergraduate Spanish classes. The paper focused on two CS boundaries: (a) auxiliary switches and (b) pronoun switches, as seen below in Table 2.2.

Table 2.2: Switches Subject/Predicate and Auxiliary/VP CS in Giancaspro (2015)

Switch type	CS boundary	Haber	Estar
Grammatical subject-predicate switches (n=24)	Switches between a lexical DP subject and a predicate	The boys habían pintado el cuadro.	The boys estaban pintando el cuadro.
Ungrammatical subject-predicate switches (n=24)	Switches between a DP pronoun and a predicate	*They habían pintado el cuadro.	*They estaban pintando el cuadro.
Auxiliary-verb phrase switches (Grammaticality unclear) (n=24)	Switches between an auxiliary verb and its participial complement	*?The boys had pintado el cuadro.	*?The boys were pintando el cuadro.

It is relevant to mention that the author carefully included switches from English to Spanish (48) and the corresponding switch in Spanish to English (49):

(48) a. The boys *habían pintado el cuadro.*(English-Spanish, Giancaspro, 2013)
'The boys had painted the picture.'

b. The boys *estaban pintando el cuadro*. (English-Spanish, Giancaspro, 2013)
'The boys were painting the picture.'

(49) a. *Los chicos* had painted the picture. (Spanish-English, Giancaspro, 2013)
'The boys had painted the picture.'

b. *Los chicos* were painting the picture. (Spanish-English, Giancaspro, 2013)
'The boys were painting the picture.'

Giancaspro (2013) found that acceptability rates for both groups were in agreement with the CF approach. Participants were able to correctly differentiate between grammatical and ungrammatical switches. However, unlike Toribio (2001a), all participants (advanced, intermediate, and beginner learners) gave similar responses regardless of their proficiency level. The reason behind this may be that the proficiency level in participants in his study was higher than the one in Toribio's (2001a) research.

Recall that all of Giancaspro's participants were undertaking upper-level Spanish classes at university (undergraduate and graduate students), whereas Toribio's (2001a) beginner group, for example, were students in the first semester of university. Participants' proficiency in Giancaspro's (2013) study was assessed by using a DELE Proficiency Test commonly used in Spanish generative acquisition research (Slabakova and Montrul, 2003). According to their results in this test, L2 Spanish and Heritage participants were placed into three groups: advanced proficiency group (with scores between 41-50), intermediate proficiency group (with scores between 30-40) and low proficiency group (with scores below 30). Therefore, the dissimilar method to measure

participants' proficiency in Giancaspro (2013) and Toribio (2001a) may explain the divergent findings in their studies regarding the correlation between grammatical judgments and L2 proficiency. Therefore, the definition of proficiency is clearly different for both studies and nevertheless, both studies conclude that L2 learners are able to correctly differentiate between acceptable and unacceptable CS constructions.

Koronkiewicz (2018) added an additional variable: CS exposure. Neither Toribio (2001a) nor Giancaspro (2013) consider that exposure to CS is needed for L2 learners to acquire native-like sensitivity to CS acceptability[3]. Koronkiewicz (2018) compared the acceptability judgments on intrasentential CS of (a) L1 English-L2 Spanish bilinguals and (b) 2L1 Spanish–English bilinguals. The author looked at how L2 proficiency and exposure to CS played a role on their CS intuitions. Specifically, the author examined at the acceptability judgments of auxiliary and pronoun switches of L1 English-L2 Spanish and compared the results with the judgments of Spanish–English bilinguals who acquired both languages as L1. Participants in this study were L1-English L2-Spanish bilinguals (n=192) who learned English since birth in a natural context and were enrolled in third- and fourth-year university Spanish courses.

Results show that both (a) L2 bilinguals with an intermediate/advanced level of Spanish and (b) L2 bilinguals who had previously engaged in CS gave more accurate (un)grammaticality CS judgments, similar to 2L1 bilinguals' judgments. In contrast, L2

[3] Toribio does not look at participants' exposure at all and although Giancaspro does include this variable (some of his participants have regular exposure to CS while some have very little or none), he does not look at how exposure might influence the accuracy of CS judgments.

learners with either (a) low proficiency level and/or (b) no exposure to CS practices provided different judgments to those of 2L1 bilinguals. Consequently, the author concluded that both proficiency and bilingual language behavior are determining factors in participants' L2 code-switching intuitions.

2.6 Structural differences and similarities between Spanish, French and English

Before turning to our research questions, we will briefly discuss some differences between the three languages in question, French, English and Spanish, as these differences could have effects on code-switching.[4]

Although we do not use subject pronouns in the tasks of this study, it should be noted that English, French and Spanish differ in relation to the properties of these pronouns. Neither English nor French are null-subject languages. However, in both English and Spanish, subject pronouns are full pronouns, while in French, they are clitics that attach to the verb. In other words, switching between a pronoun and a verb in French would be doubly ungrammatical: pronouns are functional categories and a switch at that point would be a violation of language specific rules, in other words, subject to the Word-Grammar Integrity Corollary (Belazi et al., 1994).

[4] How these differences may have an impact on code-switching will not be addressed here (but see MacSwan, 2000). We leave the question for future research.

Movement of lexical elements into functional categories is also an important difference. In English, main verbs remain in situ in the verb phrase, while in French and Spanish the conjugated verb moves to check features in the tense phrase (Pollock, 1989). In other words, in French and Spanish, a lexical element, the verb, moves into a functional node, the tense phrase. In the same way, the noun in English remains in situ, while in Spanish and French it moves over the adjective into an agreement head within the noun phrase (Cinque, 1994). Both these movements explain word order in their respective languages.

The final difference that may be relevant is the position of negation. In French, the *ne* precedes the verb while the main negative *pas* follows the verb, in Spanish the negative *no* is a clitic that attaches to the left of the verb, i.e. it precedes the verb, including to auxiliaries in the perfect tenses. In English the negative *not* follows modals and auxiliaries but precedes main verbs. (see Froud, 2001; Baker, 2003; and Chan, 2008 for a further discussion).

To sum up, this chapter aimed to present a theoretical framework on code-switching as well as a rationale for some of the concepts that will be discussed in the rest of the dissertation. We examined proposed syntactic constraints on CS research with particular detail to the Functional Head Constraint predictions for intrasentential code-switching. Building on the FHC, and as mentioned in the Introduction, our main objective is to examine L1 English/L1 French L2 Spanish learners' intuitions in correctly assessing code-switching utterances. In the following chapter we will present Experiment 1 conducted and discuss the results.

Chapter 3

3 Experiment 1

In the present dissertation, we carried out two experiments with the purpose of examining the main research question about L2 learners' grammatical knowledge on CS as predicted by the FHC. In Experiment 1, reported in this chapter, we conducted an acceptability judgment task as created by Toribio (2001a) in order to elicit grammaticality judgments in two different types of L2 Spanish learners: French and English native speakers.

Toribio's (2001a) work examined the grammatical judgments of L1 English L2 Spanish learners. We replicated Toribio (2001a) using her original grammaticality judgment task (GJT), but differed from her study in that we expanded the research scope by including L1 French learners of Spanish. Thereby, we created a French version of Toribio's AJT with the aim of analyzing the grammatical intuitions French speakers regarding code-switched utterances in the French/Spanish language pair. Including French-Spanish bilinguals in our study represents a novel aspect for the area of CS grammatical knowledge in L2 learners. In fact, and to our knowledge, no previous studies have looked at grammar intuitions of L2 learners on Spanish-French code-switching. Therefore, this dissertation aims to contribute to the literature on L2 grammar intuitions on CS, further adding to the groups of languages, French-Spanish CS.

In the following subsections we describe the methodology detailing the participants and the experimental task. Afterward, we explain the procedure and results. Finally, we present the conclusions.

3.1 Research questions

The present experiment looks at L2 knowledge of the constraints proposed by the FHC on (un)acceptability of CS sentences. Participants consisted of two groups, a group of L1 English and a group of L1 French learners of L2 Spanish with differing proficiency levels in Spanish. As discussed above, previous studies on the acceptability of CS have shown that second language learners perform in a manner consistent with knowledge of possible and impossible English/Spanish switching. Furthermore, Toribio (2001a) found that, although L2 speakers may lack overt instruction on CS and receive very little input, they are able to recognize when a code-switched sentence may be well-formed.

The research questions for this study are the following:

- Will L1 French-L2 Spanish speakers deem as acceptable code-switched sentences between a lexical head and its complement while judging code-switches between a functional head and its complement as ill-formed? We seek to verify empirically the extent to which the FHC can explain bilinguals' judgments of French-Spanish CS at the boundaries between (a) functional categories and their complements; and (b) lexical categories and their complements. Given previous research (Toribio, 2001a, 2001b; Anderson & Toribio, 2007; Giancaspro, 2013; Koronkiewicz, 2018) we hypothesize L1 French speakers learning Spanish will be able to judge the grammaticality of CS in French/Spanish.

- Will L1 English-L2 Spanish speakers deem as acceptable code-switched sentences between a lexical head and its complement and judge switches between a functional head and its complement as ill-formed? We seek to verify empirically the extent to which the FHC constraint can explain bilinguals' judgments of English-Spanish CS at the boundaries between (a) functional categories and their complements; and (b) lexical categories and their complements. Given previous research (Toribio, 2001a, 2001b; Anderson & Toribio, 2007; Giancaspro, 2013; Koronkiewicz, 2018) we hypothesize those L1 English speakers learning Spanish will be able to judge the grammaticality in English/Spanish CS.
- Given that French is a Romance language like Spanish, will L1 French speakers have an advantage over the L1 English speakers at the same level of proficiency? Although this is an empirical question that has not been addressed before, we believe that, given the universality of the FHC, there should be no overall differences between the two groups, although French speakers may have the advantage in language particular structures.
- Is language proficiency a factor in L1 English/French-L2 Spanish learners CS judgments? Following Toribio (2001a), we hypothesize that participants' proficiency level will be a significant factor in their CS un/acceptability judgments.

3.2 Participants

Participants were recruited at the University of Western Ontario in London, Ontario and at the University of Ottawa in Ottawa, Ontario. All participants were students who were attending Spanish content-courses and were invited to take part in a

linguistic study without being told it was in reference to CS; instructions were given by an experimenter known to the participants, in English for the L1 English group and in French for the L1 French group. There were two main groups of participants: (a) 29 L1 English learners of Spanish and (b) 22 L1 French speakers learning Spanish as a foreign language. All of them learnt Spanish as adults. All of the participants were born in Canada.

Table 3.1: L2 Spanish Learners Participants by L1 and Spanish proficiency (Experiment 1)

Spanish Proficiency Level (P) / **L1**	**Beginner (0-20)/50**	**Intermediate (21-39)/50**	**Advanced (40=50)/50**
L1 English n=29 Avg. age: 23 Age of participants ranged from: 20 to 34 Avg. age of acquisition of Spanish: 19 Level of Spanish classes taking at the university: *Intermediate*	n=16 Mean P=18	n=13 Mean P=34	*N/A*
L1 French n=22 Avg. age: 40 Age of participants ranged from: 26 to 68 Avg. age of acquisition of Spanish: 14 Level of Spanish classes taking at the university: *Intermediate-Advanced*	*N/A*	n=11 Mean P=35	n=11 Mean P=43

For the Anglophone native speakers, testing took place in London, Ontario whereas the testing of the L1 French group was carried out in Ottawa, Ontario. In order

to be qualified to participate in this experiment, participants in both groups were to be Anglophone and Francophone respectively, with no extensive knowledge of any language other than English or French. According to the background questionnaire filled out by all participants, both groups spoke their L1 at home.

In the particular case of the French speaker group, it was not possible to find participants that had zero knowledge of English or had not studied in English at all, given that Ottawa is a bilingual city. Some of the participants learnt English during their childhood while others did it as adults (n=6). Therefore, the Francophone participants in this study are, potentially, L3 speakers of Spanish. Nonetheless, six of them reported that their knowledge of English was limited and that they felt more comfortable speaking in Spanish than in English. All of the L1 English and most of the L1 French participants were university students. Only in the French group, two were engineers and four of them were retirees. All information was collected using a background questionnaire.

3.3 Spanish proficiency

Participants' level of Spanish was established by using the proficiency task, developed at McGill University, that has become a standard in L2 Spanish testing (see (Duffield & White, 1999; Duffield, White, Bruhn de Garavito, Montrul, & Prévost, 2002) Participants who scored between 0 and 20 out of 50 were considered L2 beginners, between 21 and 39 out of 50 were considered intermediate, and between 40 and 50 were considered advanced.

In order to ensure homogeneity with regard to participants' Spanish proficiency, L1 French individuals who scored as beginners were excluded as there were too few (n = 6) to make valid comparisons. At the same time, we did not find any advanced L1 English speakers. As a consequence, although we can compare across different proficiency levels for both English and French separately, the only level at which it is possible to compare the two groups with each other is at the intermediate level.

All participants completed the following tests:

1- Screening Tests: a consent form, a language background questionnaire, and a Spanish proficiency task.
2- Experimental task: An Acceptability Judgment Task (AJT) based on Toribio (2001a).

The time of completion for all the tasks was between 1.5 hours and 2 hours. Respondents participated in the experiment voluntarily. Participants in the Anglophone group were students at the university and received a bonus mark for their participation. The Francophone participants received monetary compensation. Both groups of participants also performed a Self-Paced Reading Task that is not going to be reported in this study.

3.4 Experimental Task: Acceptability Judgment Task (AJT)

It is important to note that, although we are focusing on linguistic constraints, we cannot discard the importance of attitudes towards CS. Studies have found that attitudes are a determining factor in CS judgments (Anderson, 2006; Anderson & Toribio, 2007; MacSwan & McAlister, 2010). Therefore, eliciting bilinguals' code-switching intuitions may be affected by the strong prejudice towards CS felt by speakers of many languages since "[it] may negatively affect the quality of elicited data" (MacSwan & McAlister, 2010: 529). Such prejudice has made people deem CS as linguistic 'interference' (Weinreich, 1953), the result of bilingual deficiency, and even linguistic degradation. The degree of acceptability may not only involve participants' judgment on the CS utterance itself but also the attitudes that people have towards CS.

Although we may not completely rule out external factors when studying the structural constraints on code-switched forms, we chose the acceptability judgment task method to minimize factors such as prejudice from affecting the results. When performing the experiment, we highlighted to participants to judge how acceptable the sentence sounded trying not to base their judgment on their own ideas about CS. We encouraged participants to draw on their intuitions about language rather than their conformity with normative pressures or adherence to prescriptive rules. We also explained that even in the event that they may not like or condone language switching as a social practice, we were calling on their opinion on its form. We also explained to

participants that the questionnaire was not intended to test their Spanish proficiency; nor was it a model for how Spanish should be spoken.

Acceptability judgment tasks are a useful method to collect data on L2 learners' intrinsic knowledge on CS grammaticality and to test the FHC theoretical predictions on second language learners. AJTs allow us to control the type of stimuli we aim to test (un/grammatical sentences) as well as the type of switch boundary structures. AJTs provide evidence on structures that are unusual in natural communication contexts, i.e. ungrammatical code-switched utterances.

As we mentioned, the experimental task used in this study drew on the Acceptability Judgment Task administered in Toribio (2001a). The original English-Spanish survey, consisting of 22 sentence pairs, was translated to Spanish-French code-switching strings plus one practice sentence.

The aim of this task is to assess participants' knowledge of code-switching and their acceptance or rejection of (un)grammatical sentences. The task consisted of 44 sentences of which 22 correspond to grammatical code-switches since the cut-off switch is between a lexical head and its complements, while 22 sentences are ungrammatical code-switches between a functional head and its complements. Tables 3.2 and 3.3 lay out all of the code-switching types that were tested in the AJT.

Table 3.2: Summary of the code-switching types included in the AJT for L1 French speakers

	Switch Type	Example
Unacceptable Switches (Five functional categories)	After Modal/Auxiliary (n = 4)	**Los estudiantes han* élu un nouveau représentant 'The students had elected a new representative.'
	After Complementizer (n = 4)	*La clinique ne traite pas les étudiants qui *no tienen seguro médico* 'The clinic does not treat students that do not have medical insurance.'
	After Negation (n = 4)	**La biblioteca normalmente no* ouvre pas le dimanche matin. 'The library normally does not open on Sunday mornings.'
	After Quantifier/Number (n = 4)	*Sur ce campus, de nombreux *estudiantes andan en bicicleta* 'On this campus many students ride bicycles.'
	After Adjective (n = 2)	*L'étudiant fier *celebraba en San Antonio*. 'The proud student celebrated in San Antonio.'
Acceptable Switches (Seven lexical categories)	Between Subject & Predicate boundary (n = 4)	Plusieurs de mes étudiants *llegaron tarde a la conferencia del jueves.* 'Several of my students arrived late for Thursday's lecture.'
	Between Verb & Complement (n=4)	Le rédacteur en chef du journal avait écrit *un fuerte comentario.* 'The editor of the paper had written a strong commentary.'
	Before Complementizer (n = 4)	La clinique ne traite pas les étudiants *que no tienen seguro médico.* 'The clinic does not treat students that don't have medical insurance.'
	Before Quantifier/Number (n = 4)	Sur ce campus, *muchos estudiantes andan en bicicleta.* 'On this campus many students ride bicycles.'
	Before the Preposition (n = 4)	L'étudiant a laissé le chien enjoué *debajo del árbol en el parque*. 'The student left the playful dog underneath the tree in the park.'
	After Preposition (n = 4)	L'étudiant a laissé le chien enjoué sous *el árbol en el parque* ' The student left the playful dog underneath the tree in the park.'
	After Adjective (n=2)	L'étudiant fier *de sus éxitos celebraba en San Antonio*. 'The student proud of his accomplishments celebrated in San Antonio.'

Table 3.3: Summary of the code-switching types included in the AJT for L1 English speakers

	Switch Type	Example
Unacceptable Switches (Five functional categories)	After Modal/Auxiliary (n = 4)	**Los estudiantes han* elected a new representative. 'The students had elected a new representative.'
	After Complementizer (n = 4)	*The clinic does not treat students that *no tienen seguro médico.* 'The clinic does not treat students that don't have medical insurance.'
	After Negation (n = 4)	**La biblioteca normalmente no* opens on Sunday mornings. 'The library normally does not open on Sunday mornings.'
	After Quantifier/Number (n = 4)	*On this campus many *estudiantes andan en bicicleta*. 'On this campus many students ride bicycles.'
	After Adjective (n = 2)	*The proud student *celebraba en San Antonio.* 'The proud student celebrated in San Antonio.'
Acceptable Switches (Seven lexical categories)	Between Subject & Predicate boundary (n = 4)	Several of my students *llegaron tarde a la conferencia del jueves.* 'Several of my students arrived late for Thursday's lecture.'
	Between Verb & Complement (n=4)	The editor of the paper had written *un fuerte comentario.* 'The editor of the paper had written a strong commentary.'
	Before Complementizer (n = 4)	The clinic does not treat students *que no tienen seguro médico.* 'The clinic does not treat students that don't have medical insurance.'
	Before Quantifier/Number (n = 4)	On this campus *muchos estudiantes andan en bicicleta.* 'On this campus many students ride bicycles.'
	Before the Preposition (n = 4)	The student left the playful dog *debajo del árbol en el parque*. 'The student left the playful dog underneath the tree in the park.'
	After Preposition (n = 4)	The student left the playful dog underneath *el árbol en el parque* 'The student left the playful dog underneath the tree in the park.'
	After Adjective (n=2)	The student proud *de sus éxitos celebraba en San Antonio*. 'The student proud of his accomplishments celebrated in San Antonio.'

The target sentences were presented in pairs. Participants were asked to read each set of sentences and indicate whether the (a) sentence was acceptable, whether the (b) sentence was acceptable, whether neither sentence was acceptable (c), or whether both sentences were acceptable (d), as shown in (1) below.

(1) (a) *El estudiante no sabe* that his exam will be take-home.

(b) *El estudiante no sabe que* his exam will be take-home.

__ (a) is acceptable __ (c) both are acceptable

__ (b) is acceptable __ (d) neither is acceptable

In this example, we expected that the participants would respond by indicating the acceptability of (a). It is predicted that the second sentence (b) is unacceptable since the switch site is between the functional complementizer and the subordinate sentence.

Of particular interest in corroborating the Functional Head Constraint is participants' acceptance/rejection of switching at the junctures of functional versus lexical categories and their complements. Please see Appendix A and B for the complete version of the AJT in English-Spanish and French-Spanish CS, respectively.

Note that we can compare the results of the following pairs of sentences because they include an acceptable code-switch (2) and unacceptable switch (3) at the relevant juncture:

(2) *Los estudiantes han elegido* a new representative. (Spanish-English)

Los estudiantes han elegido un nouveau représentant. (Spanish-French)

'The students had elected a new representative.'

(3) **Los estudiantes han* elected a new representative. (Spanish-English)

**Los estudiantes han* élu un nouveau représentant. (Spanish-French)

'The students had elected a new representative.'

However, the task included two categories for which it is not possible to compare results since they did not have a grammatical/ungrammatical counterpart. These categories are: code-switching between the subject and the predicate (n=2), which were both grammatical (4) and served as practice sentences; and items that tested switching after negation (n=4), which were all ungrammatical (5). The difficulty with negation perhaps lies in the important differences in the way negation works in the three languages.

(4) Plusieurs de mes étudiants *llegaron tarde a la conferencia del jueves*. (French-Spanish)

Several of my students *llegaron tarde a la conferencia del jueves*. (English-Spanish)

'Several of my students arrived late for Thursday's lecture.'

(5) **La biblioteca normalmente no* ouvre pas le dimanche matin. (Spanish-French)

**La biblioteca normalmente no* opens on Sunday mornings. (Spanish-English)

'The library normally does not open on Sunday mornings.'

3.5 Results

At first sight, it seems L2 learners of Spanish are able to make the distinction between well-formed and ill-formed code-switches. As seen in Table 3.4, the acceptance rate for grammatical switches (switches between lexical elements and their complements)

is higher than for ungrammatical switches (switches between functional elements and their complements). This is so whether the first language is English or French.

Table 3.4: Mean of rate of Acceptability (Standard Deviation is given in parentheses)

			Acceptable Switches (n=26) (Switching after lexical elements)	**Unacceptable Switches** (n=18) (Switching after functional elements)
Group	**L1 English**	Beginner (n=16)	74.55 (12.97)	55 (17.51)
		Intermediate (n=13)	77.20 (10.96)	55 (22.27)
	L1 French	Intermediate (n=11)	75.65 (14.80)	50.45 (17.10)
		Advanced (n=11)	78.57 (14.11)	40.45 (22.30)
		Totals:	76.49 (1.68)	50.23 (2.88)

However, Table 3.4 also points to a rather surprising finding: there is no difference between the proficiency levels for each group, that is, there is no difference between the L1 English beginners and intermediates, or between the L1 French intermediates and advanced. We will address this important result in detail in the discussion section.

The results in Table 3.4 are corroborated by a repeated measures ANOVA which shows that there is no significant difference between the groups, F (3, 47) = 0.304, p =

0.82. However, there is a significant difference in responses to the type of CS, F (11, 517) = 28.524, p = 0.0001. There is also an interaction between group and sentence type, F (33, 517) = 2.128, p= 0.0003.

Now we will look in detail at the comparison between the different types of code-switching in the AJT. Recall that target sentences in the AJT task were presented in pairs in an attempt to focus participants' attention to the switch boundary. Recall also that, for most of the sentence pairs in the questionnaire, we can make comparisons of the results between the answers that the participants gave to the types of sentences that corresponded to grammatical switches vis-à-vis their non-grammatical equivalents. Regarding cases in which no comparison is possible, however, it is interesting to observe, as shown in Table 3.5, that the majority of participants recognize the grammaticality of subject-predicate code-switched sentences in both directions. They also recognize the ungrammaticality of switches around negation, and in this case the French advanced group is particularly accurate.

Table 3.5: Mean Subject-Predicate and Negation Code-switching Type by L1 (SD is given in parentheses)

Groups \ CS Type		S-Pred G (n=2)	Neg U (n=4)
L1 English	Beg	79.69 (18.75)	46.88 (30.10)
	Int	84.62 (16.26)	44.23 (29.14)
L1 French	Int	86.36 (17.19)	47.73 (20.78)
	Adv	86.36 (17.19)	25.00 (15.81)

We turn now to the results of categories that have a counterpart: (6) switches after the verb vs switching after the modal/auxiliary, (7) switches before vs after the complementizer; (8) switches before and after a quantifier; (9) grammatical and ungrammatical switches after an adjective; and (10), switching before and after prepositions. Examples of these contrasts are shown below:

(6) Switches after the verb vs after the modal/auxiliary

Grammatical

Le rédacteur en chef du journal avait écrit *un fuerte comentario.* (French-Spanish)
The editor of the paper had written *un fuerte comentario.* (English-Spanish)
'The editor of the paper had written a strong commentary.'

vs

Ungrammatical

**Los estudiantes han* élu un nouveau représentant. (Spanish-French)
**Los estudiantes han* elected a new representative. (Spanish-English)
'The students had elected a new representative.'

(7) Switches after a complementizer

Grammatical (before)

La clinique ne traite pas les étudiants *que no tienen seguro médico*. (French-Spanish)
The clinic does not treat students *que no tienen seguro médico.* (English-Spanish)
'The clinic does not treat students that don't have medical insurance.'

vs

Ungrammatical (after)

* La clinique ne traite pas les étudiants qui *no tienen seguro médico.* (French-Spanish)
* The clinic does not treat students that *no tienen seguro.* (English-Spanish)
'The clinic does not treat students that don't have medical insurance.'

(8) Switches after a Quantifier

Grammatical

Sur ce campus *muchos estudiantes andan en bicicleta*. (French-Spanish)
On this campus *muchos estudiantes andan en bicicleta.* (English-Spanish)
'On this campus many students ride bicycles.'

vs

Ungrammatical

*Sur ce campus de nombreux *estudiantes andan en bicicleta*. (French-Spanish)
*On this campus many *estudiantes andan en bicicleta.* (English-Spanish)
'On this campus many students ride bicycles.'

(9) Switches after an adjective

Grammatical

L'étudiant fier *de sus éxitos celebraba en San Antonio*. (French-Spanish)
The student proud *de sus éxitos celebraba en San Antonio*. (English-Spanish)
'The student proud of his accomplishments celebrated in San Antonio.'

vs

Ungrammatical

* L'étudiant fier *celebraba en San Antonio*. (French-Spanish)
* The proud student *celebraba en San Antonio.* (English-Spanish)
'The proud student celebrated in San Antonio.'

(10) Switch before a preposition

Grammatical

L'étudiant a laissé le chien enjoué sous *el árbol en el parque*. (French-Spanish)
The student left the playful dog underneath *del árbol en el parque*. (English-Spanish)
'The student left the playful dog underneath the tree in the park.'

vs

Ungrammatical

* L'étudiant a laissé le chien enjoué *debajo de el árbol en el parque*. (French-Spanish)
* The student left the playful dog *debajo el árbol en el parque.* (English-Spanish)
'The student left the playful dog underneath the tree in the park.'

Tables 3.6 and 3.7 summarize the results between responses to grammatical and ungrammatical comparable sentence types for each of the groups.

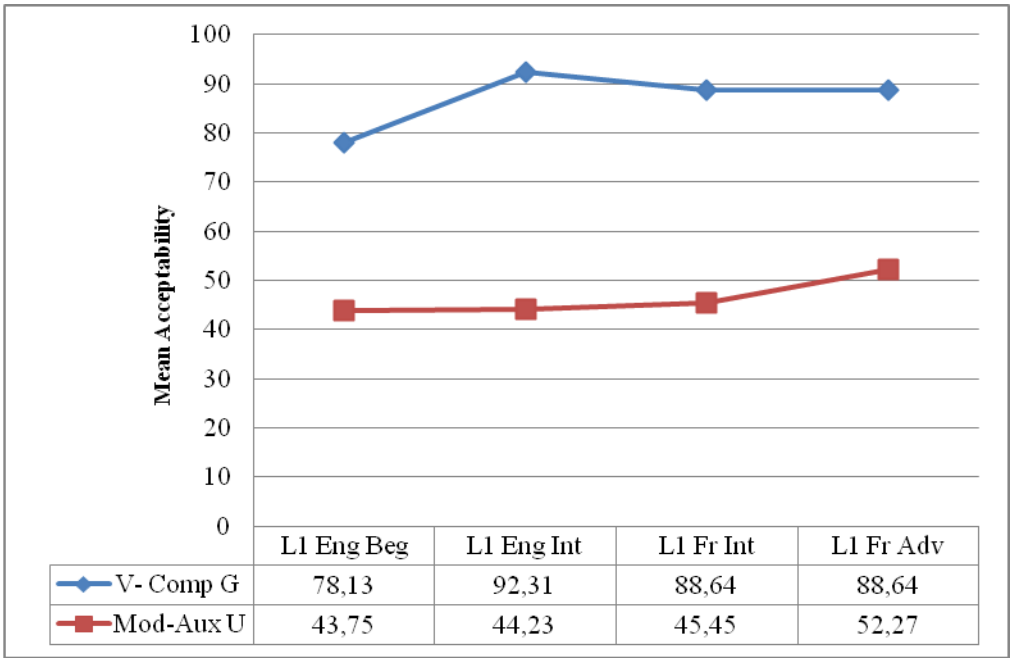
Table 3.6: Mean for each type of grammatical code-switching category by group (SD given in parenthesis)

Groups	CS Type	V-Comp G	Compltzr G	Quant G	Aft-Adj G	Bef-Prep G
L1 English	Beg	78.13 (30.10)	76.56 (30.91)	92.19 (19.83)	81.25 (21.41)	76.56 (24.95)
	Int	92.31 (12.01)	76.92 (23.85)	86.54 (21.93)	78.85 (20.02)	75.00 (22.82)
L1 French	Int	88.64 (13.06)	77.27 (26.11)	95.45 (15.08)	70.45 (18.77)	61.36 (28.20)
	Adv	88.64 (17.19)	79.55 (24.54)	95.45 (10.11)	84.09 (25.67)	47.73 (28.40)

Table 3.7: Mean for each type of ungrammatical code-switching category by group (SD is given in parenthesis)

Groups	CS Type	Mod-Aux U	Compltzr U	Quant U	Aft-Adj U	Aft-Prep U
L1 English	Beg	43.75 (35.94)	71.88 (25.62)	68.75 (24.14)	81.25 (21.41)	43.75 (17.08)
	Int	44.23 (43.49)	61.54 (31.65)	71.15 (28.59)	78.85 (20.02)	53.85 (13.87)
L1 French	Int	45.45 (31.26)	59.09 (28)	40.91 (40.73)	70.45 (18.77)	59.09 (30.15)
	Adv	52.27 (39.46)	61.36 (25.89)	40.91 (32.16)	84.09 (25.67)	22.73 (26.11)

The first thing to note in Tables 3.6 and 3.7 is that the standard deviation for almost all types is very high. This points to a great deal of variability within each group. As we saw above, a repeated measures ANOVA showed no difference between the groups but the difference between the CS types was significant. Unfortunately, a post-hot Scheffe F test shows no significant difference between grammatical and ungrammatical switches: p = 0.453. This is probably due to the low number of participants. We will examine each of the contrasting sentence types.



	L1 Eng Beg	L1 Eng Int	L1 Fr Int	L1 Fr Adv
V- Comp G	78,13	92,31	88,64	88,64
Mod-Aux U	43,75	44,23	45,45	52,27

Figure 3.1: Switches between the verb and its complement (grammatical) and an auxiliary and verb (ungrammatical)

There is a clear tendency in all groups to distinguish between the acceptable and unacceptable switch in all 4 groups, although this difference is much lower in the case of English beginners. Because of the high variability between the participants this tendency

does not reach significance: $p = 0.94$. It is also clear that judgments are similar for both the English and French intermediate groups, which show a comparable proficiency level, and that judgments are also similar across proficiency levels within each language group, again with the exception of the beginners.

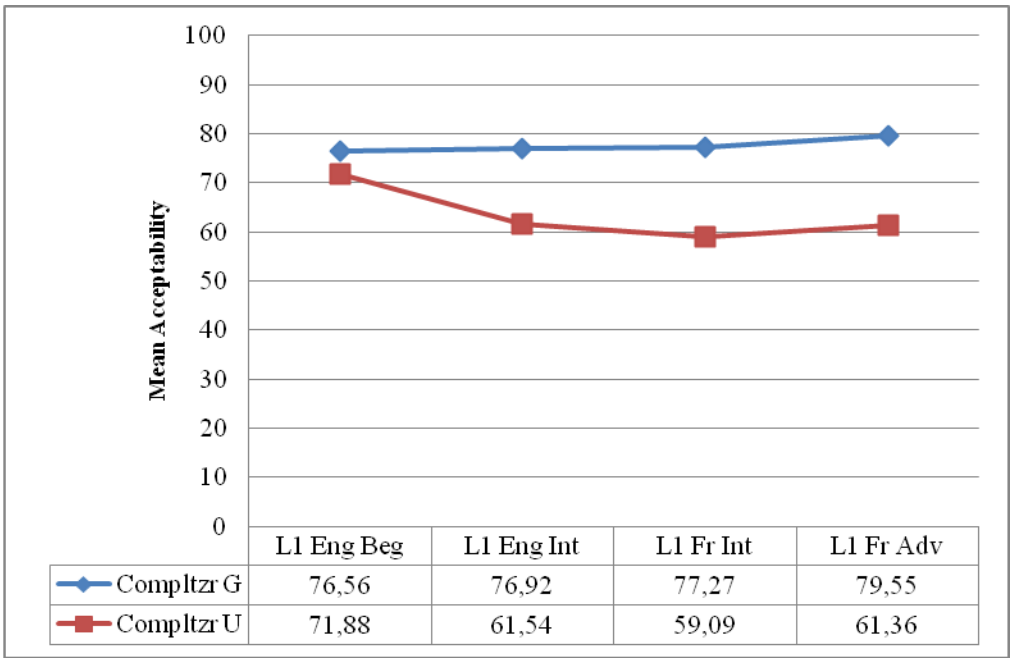


Figure 3.2: Switches before and after a complementizer

None of the groups seem to make a clear distinction between grammatical and ungrammatical sentences, although the intermediate groups and the French advanced are going in the right direction. Furthermore, their acceptance rate for grammatical sentences is low compared to the acceptance rate in other categories, as if the participants could not make up their minds. This is somewhat surprising as bilingual native speaker intuitions seem particularly strong here.

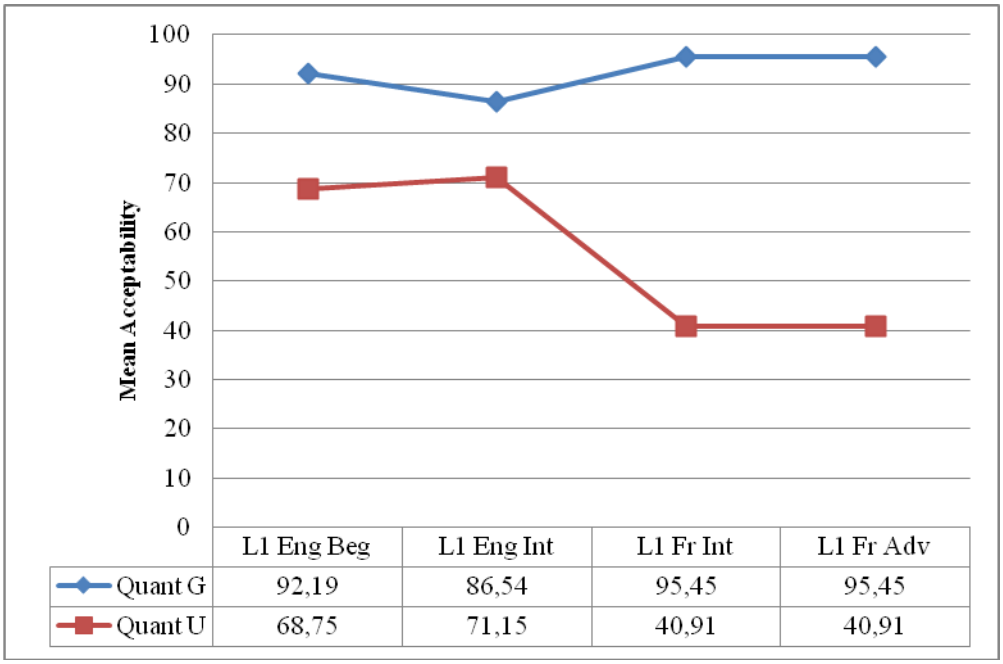


Figure 3.3: Code-switching before and after a quantifier

All groups accept the grammatical sentences, but only the French participants seem to dislike the ungrammatical sentences. They do so both at the intermediate and advanced level, the only time we find a difference between the responses based on L1.

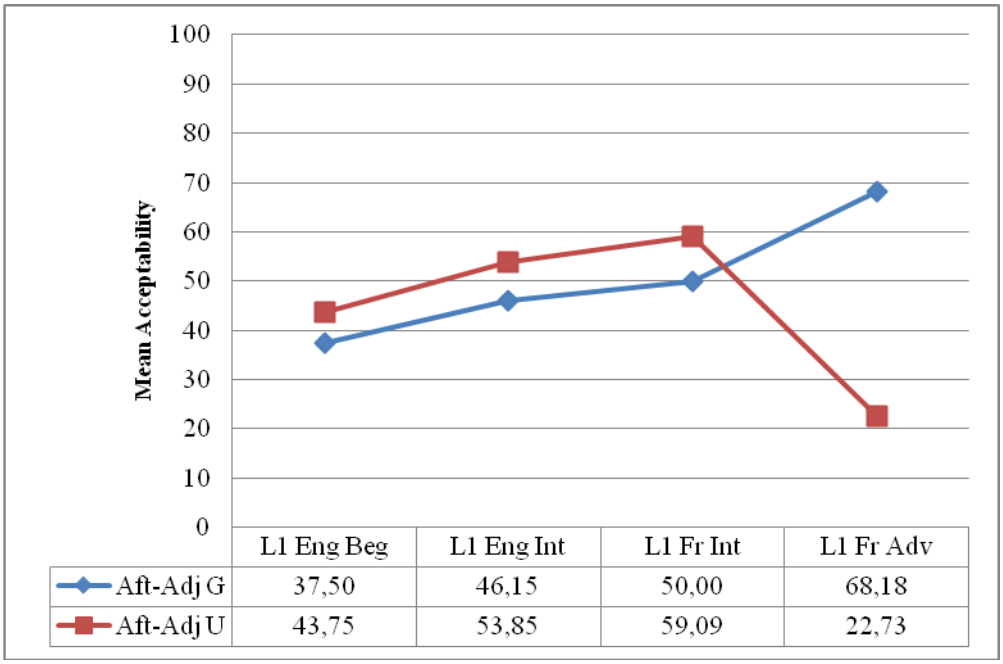


Figure 3.4: Code-switching in the presence of adjectives

Only the French advanced group distinguishes between the grammatical and ungrammatical sentences. What is interesting, however, is that there seems to be an across the board rejection of grammatical sentences. It would seem that the mere presence of an adjective after the noun leads to the feeling of unacceptability.

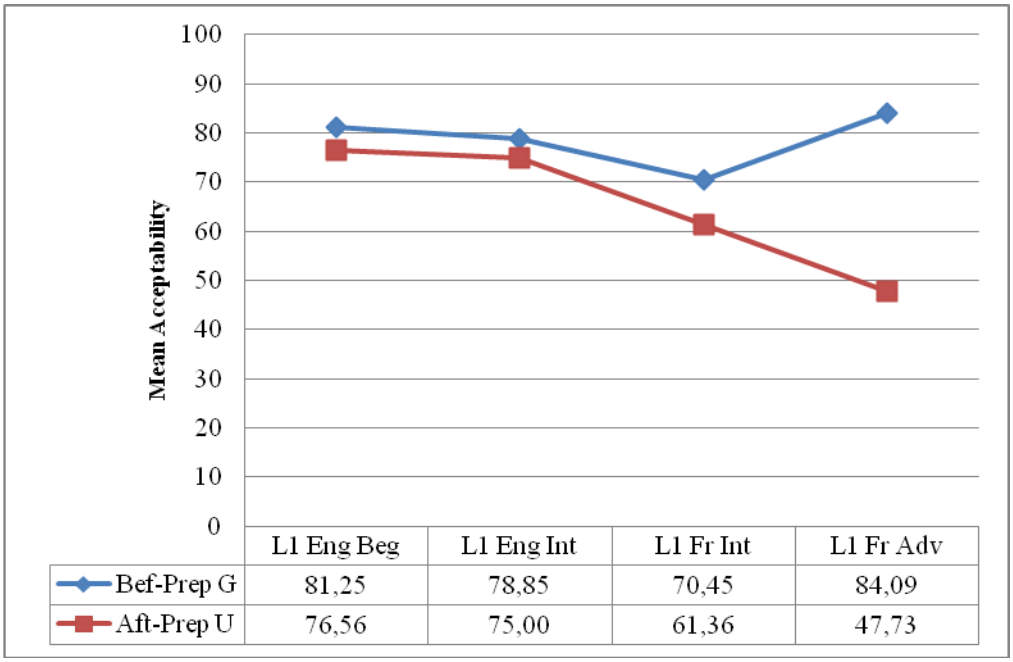


Figure 3.5: Switches before and after prepositions

Only the French advanced group seems to reject switches following a preposition. Acceptance rates for switches before and after seem high.

Table 3.8 below summarizes the results, indicating which contrasts seem to be present in each of the groups.

Table 3.8: Significant differences found by CS Type Contrast

Group	Switch Type	V Comp G vs Mod/Aux U	G Complzr vs U Complzr	G Quant vs U Quant	G Adj vs U Adj	Bef-Prep G vs Aft-Prep U
L1 English	Beginner (n=16)	✓	✗	✗	✗	✗
	Intermediate (n=13)	✓	✗	✗	✗	✗

L1 Frecnh	**Intermediate (n=11)**	✓	✗	✓	✗	✗
	Advanced (n=11)	✓	✗	✓	✓	✗

3.6 Discussion and conclusions

As we explained in Chapter 2, the Functional Head Constraint (Belazi et al, 1994) has two main predictions. On the one hand, switches between functional heads, such as Complementizer, Determiner, and Negation, and their complements, results in an ungrammatical sentence. According to the FHC, the explanation for this lies in the fact that functional heads select the features of their complement and so, when a functional head and its complement are in different languages, the derivation crashes due to the mismatch in language feature (but see MacSwan, 1999, 2000). As a consequence, the switch is ungrammatical. In contrast, when a given switch occurs between a lexical head, such as a verb or noun and its complement, the sentence is grammatical. Based on this, we aimed to test whether participants can exhibit sensitivity to syntactic well-formedness, i.e., recognize the distinction between grammatical, or possible switches, and ungrammatical, or impossible, switches.

Recall that, from a statistical point of view, there were no significant differences between the responses of the four groups. In other words, there was no difference between the two intermediate groups that differed in their L1, nor across proficiency levels in each of the language groups separately. The reason for this seems to lie in the great variability in responses. As a consequence, a great many of our conclusions have to

be tentative, based on tendencies. These results are in contrast to other studies (including Toribio's (2001a) study) that have found significant differences across levels. Because we used the same test as Toribio (2001a) in our study, we would like to point out to important differences that may explain some of the results.

The first contrast between Toribio's study and ours is that the participants of the present study are learning Spanish in an environment where it is clearly a foreign language. There are no large communities of Spanish speakers. This may also explain why Toribio's results are much more clear-cut from the beginning levels. The second difference is that we did not rely on number of semesters of study but instead used a placement test to establish the language level of the speakers. As also pointed out by Giancaspro (2013), it is quite probable that there is little equivalence between levels in these two studies on the one hand and Toribio's experiment.

In our discussion, we will focus on each of the language groups first. We asked whether L1 French speakers who are learning Spanish as a foreign language are able to distinguish between acceptable and unacceptable code-switches in line with the predictions of the FHC. The answer to this question is affirmative, particularly at the advanced level. Overall, these results are consistent with previous studies on English/Spanish code-switching showing that L2 learners are able to acquire CS linguistic knowledge, i.e. the structural restrictions on L2 CS (Toribio, 2001a; Dussias, 2003; Koronkiewicz, 2018; Giancaspro, 2013, 2015).

If we look at proficiency level, we only see change between the intermediate and advanced groups in one category, that of adjectives, but even here the two groups do not

differ that much. It would seem L1 French speakers establish intuitions about grammaticality from at least the intermediate level.

Turning now to the L1 English speaking group, results do not unambiguously show the same results as previous studies. The only distinction that appears to be recognized by both beginners and intermediate English speakers is that between the grammaticality of switching between a verb and its complements and the ungrammaticality of switching between the auxiliary and its complement, the verb phrase. They seem to be close to recognizing grammaticality in the case of complementizers, but their judgments in all other categories are pretty much undifferentiated. Furthermore, unlike Toribio (2001a) but similar to Giancaspro (2013), level does not have an effect. Of course, it may be possible that at an advanced level we would find results more in line with the FHC.

Our remaining question was in relation to a possible advantage for L1 French speakers over English speakers. The answer is somewhat affirmative at the intermediate stage, which is where possible comparisons are made. Although originally we speculated that the similarities between French and Spanish could be part of the explanation, there is one other possibility. Because the French speakers live in Ottawa, a French/English bilingual city, they may be exposed to code-switching, albeit in another pair of languages. Their ear may be more attuned to hearing speakers switch between languages, and their attitudes may therefore be more positive (but see Poplack, 1988).

Although we did not find clear indications that level of proficiency plays an overall effect, it does seem that one of the points we can take away from this study is that

not all category contrasts are learned at the same time. All four groups accepted a switch between the subject and the verb phrase, all four distinguished between a switch separating a verb and its complement from one separating an auxiliary, which, as we saw above, is a clitic in Spanish, and the verb phrase. At the same time, only very advanced French speakers were on their way to accepting a switch in the case of grammatical postnominal adjectives with complements. This structure is infrequent in the language and it is not surprising that proficiency level may play a large role in the ability to process it. We do not, therefore, reject the role of proficiency, but rather argue that it has to be examined in detail in order to see its effects.

For future studies, we would like to look at individual results, given the large standard deviations we found. It is possible that external factors, such as attitudes and motivation, may turn out to be relevant.

The following chapter presents Experiment 2 in this dissertation.

Chapter 4

4 Experiment 2

Experiment 2 presented here further explores the general research question of whether L2 Spanish learners recognize grammatical from ungrammatical intrasentential code-switched utterances. For this Experiment 2, we carried out two tasks: a Self-Paced Reading Task (SPRT) and an Acceptability Judgment Task (AJT), in order to examine Spanish second language learners' grammar intuitions on CS.

This chapter is divided into two main sections. The first section covers the SPRT which provided data on the learners' grammatical knowledge on CS by observing their real-time processing costs during reading of un/grammatical switches. The second section presents the AJT experimental task which provided information on learners' grammatical intuitions based on their acceptability patterns.

Recall that in chapter 2, we presented previous studies that analyzed the grammatical characteristics and constraints of CS. This dissertation seeks to test the grammatical judgments and linguistic intuitions towards CS in two groups of Spanish learners: L1 English and L1 French. Specifically, this study will focus on the less-investigated area of French-Spanish learners' grammatical intuitions. The present chapter describes the research organization for Experiment 2 detailing the variables, participants, limitations, data collection, as well as data analysis procedures employed.

4.1 Self-paced Reading Task

4.1.1 Introduction

This project drew on the research findings around CS grammaticality already reviewed in chapter 2. The two groups of participants observed, L1 English and L1 French bilinguals, belong to different milieus; therefore group membership may have an effect on the speakers' grammatical intuitions and judgments towards CS occurrences. This comparative analysis examined possible intersections of, for example, code-switching acceptability and language proficiency. These aspects will be explained in more detail in the methodology section below.

Note that the most common methodological approaches employed to study the L2 learners' knowledge about CS are: Naturalistic Studies (Poplack, 1980; Myers-Scotton, 2006), Grammaticality Judgment Tasks (GJT) (Toribio, 2001a; Anderson, 2006), Matched Guise Tasks (Anderson, 2006; Anderson & Toribio, 2007), Language Attitude Surveys (Anderson, 2006), Acceptability Judgment Tasks (AJT) (Giancaspro, 2013), Reaction Time Task (Rakowsky, 1989; Cheng & Howard, 2008), Controlled and Naturalistic Language Activities (reading task, recounting task, and writing (Toribio, 2001), and Elicited repetition/imitation Task (Toribio et al. (1993). (See Gullberg, Indefrey & Muysken, 2009), for a review in the research techniques for the study of code-switching).

A novel feature of the present study was the implementation of a methodology increasingly used in the investigation of CS: the Self-paced Reading (SPR) paradigm. With this task we aim to examine participants' reading times (RT) when reading both

grammatical and ungrammatical forms of code-switching. This method will contribute to a better understanding of grammatical intuitions towards code-switching by measuring quantitative and qualitative differences in item responses.

In this dissertation, we decided to used the SPR method as a complement to the acceptability judgment task also conducted in this Experiment 2, since "grammatical processing relies on existing knowledge of grammar that is stored in memory […] SPR data can be seen as an indirect measure of grammatical competence and are often regarded as a relatively more direct or more implicit measure of grammar than off-line judgments because the time constraints of on-line processing presumably allow less room for the application of explicit grammar rules" (Jegerski, 2014: 7). Therefore, when looking at L2 learners' grammatical knowledge on CS, the SPR technique allows us to access participants' intuitional knowledge when processing grammaticality in a less metalinguistic way. A high cost in reading times for ungrammatical switches stimuli will indicate participants' difficulty to process violations of CS constraints.

4.1.2 Self-paced Reading model and Code-Switching Studies

The self-paced reading model is an on-line (i.e., real-time) technique created in psycholinguistics in the 1970s to examine participants' language comprehension (Aaronson & Scarborough, 1976; Mitchell & Green, 1978). In a self-paced reading task (SPRT), participants read through segments that can range from single words, phrases, and sentences to complete text passages. As we will explain in the methodology section, we used SPRT to examine reading times of code-switched sentences divided by regions or segments. Subjects' reading comprehension is measured with the reading times (RT)

that are recorded when they read a given word or segment at a time. Therefore, the reading times correspond to the interval of time between application of a code-switching string, the stimulus, and the detection of participants' comprehension. For this, a first part of the sentence appears on the computer screen and subjects read it at their own pace. When they finish reading, they press a button to indicate when they are ready to read the next part, and they repeat this process until the end of the sentence.

In general, CS comprehension offers less control for bilinguals than CS production. In this latter, speaker can decide whether to speak in one language or code-switch when communicating, depending on pragmatic and contextual aspects. However, in comprehension, bilinguals are unaware of when CS will take place. Thus, code-switching comprehension can constitute a productive to study grammaticality, which is what this dissertation aims to examine.

It is assumed that reading times will reflect participants' linguistic processing. Using this method, it is predicted that "relatively longer reading times are taken as indications of processing difficulty, while faster reading times are interpreted as a sign that facilitation occurred" (Jegerski, 2014: 4). In this sense, ungrammatical structures that pose a processing difficulty for participants will require longer times to process. Moreover, reading time data allow us to assess whether participants are sensitive to the grammatical structure of the code-switched sentence as grammatical switches will be more rapidly understood and assessed than ungrammatical ones.

In second language acquisition, the SPR has been used to observe differences between native speakers and adult L2 learners (e.g. Juffs & Harrington's (1995) study on

grammatical competence vs access to Universal Grammar after the critical period; White & Juffs' (1998) research on competence versus performance; Clahsen and Felser's (2006) study on L2 processing and the Shallow Structure Hypothesis, among others).

Using the self-paced reading paradigm in code-switching research, there has been an emphasis on studying the effect of switching directionality in the processing of code-switched sentences in real time costs in production and comprehension (Bultena, Dijkstra, & Van Hell, 2015a; Litcofsky & Van Hell, 2017; Beatty-Martínez and Dussias, 2017; Fernandez, Litcofsky, and Van Hell, 2019). Measuring the processing costs of switch direction has shown dissimilar effects. Looking at the cost of reading, most studies have showed that the cost is larger when switching from the L2 into L1 than vice versa. Some other studies on comprehension indicate however that switching into the L2 represents a larger processing difficulty than switching into the L1 (Proverbio et al., 2004; Van der Meij et al., 2011, Bultena, Dijkstra & van Hell, 2014) while other studies found no switch cost in either direction for reading of sentences (Costa & Santesteban, 2004; Costa et al., 2006; Meuter & Allport, 1999, Ibáñez et al., 2010) in situations where both speakers are equally proficient in L1 and L2 and in unbalanced bilinguals.

In one example, Bultena, Dijkstra & van Hell (2014) examined to what extent L2 proficiency and cognates affect language switch costs in sentence comprehension. They carried out a self-paced reading task including sentences that switched between participants' L1 Dutch and L2 English. Results indicated an effect of the switch directionality in the reading times since switches into L2 had a cost while switches into L1 did not show a significant cost for participants. Even more, the costs were correlated

with L2 proficiency since reading costs in language comprehension are determined by language dominance.

In another study, Bultena, Dijkstra, & Van Hell (2015a) used a SPRT to test the triggering hypothesis which claims that cognates can operate as triggers that ease a switch to the other language (Clyne, 1967; 2003). They looked at how a cognate influences the processing of an intrasentential switch. They also observed how CS directionality and L2 language proficiency affected the comprehension of code-switched sentences. Participants, two groups of Dutch-English bilinguals with different L2 proficiency levels, were asked to read code-switched sentences presented in a linear non-cumulative self-paced reading task as well as to answer comprehension questions after each sentence.

Participants were visually presented with CS sentences (1):

(1) *De ervaren schilders schetsen* the flowers from a distance. (Dutch-English)
'The experienced painters sketch the flowers from a distance.'

The switches in the task occurred in the middle of the sentence and were preceded by a cognate in some cases and a non-cognate in others. Disproving the triggering hypothesis, results showed that the presence of a cognate did not influence code-switch processing. Moreover, CS directionality had an effect on processing: Reading times showed a cost for L1 Dutch-L2 English switches, but not vice versa; i.e., the cost for switches from the dominant language into the L2 was higher than the cost for switches from L2 into L1. Finally, participants with more advanced L2 proficiency had lower

switching costs into the L2. That is, L1-L2 switches had a smaller cost for participants with a higher level of proficiency in comparison to those with a less advanced level.

Similar results were found by Wang (2015) who concluded that switching to the weaker L2 language demands more effort than switching to the dominant L1 and thus results in a higher processing load. In Wang (2015) English-Chinese bilinguals were presented a maze task that consisted in choosing one of two alternative words presented on the computer screen to complete a sentence (2).

(2) *Monolingual sentence*
The … rain/were but/fell clock/silently

Expected construction: The rain fell silently

CS sentence
I polished/thus my/drew 鞋/Xié 'shoe' sad/yesterday

Expected construction: I polished my 鞋 yesterday

All of the sentences were in English and CS sentences contained one Chinese noun in subject or in object position. Half of his participants were English dominant and the other half were Chinese dominant. Results showed that the Chinese-dominant bilinguals had faster processing times for code-switched Chinese nouns than the English-dominant group. He also found that both groups showed higher cost on the following word that switched back to English. Wang concludes that cognitive efforts to inhibit the other language on the code-switched word do not depend on language proficiency.

Litcofsky & Van Hell (2017) examined the effect of CS direction on the comprehension of intrasentential CS in Spanish-English bilinguals. Participants were proficient in their two languages and used code-switching in their everyday life. The study conducted two experiments: a SPRT and electroencephalography (EEG)

measurements analyzed via both event-related potentials (ERPs) and time-frequency analysis (TFR). In the SPRT in particular, participants were presented randomly English monolingual sentences (3) and English-Spanish intrasentential switched sentences (4).

(3) Each year, the shopkeeper makes his own toys for the young children.
(4) Each year, the shopkeeper makes his own *juguetes para los niños pequeños*.

Results from this task showed that reading switches from L1 into L2 cause a higher cost than switches from L2 to L1. The difference in the directionality cost could be interpreted as being a result of bilinguals' continual adjustment of their level of activation of their native language and their L2 for language comprehension. Furthermore, when the switch occurs from the L1 into the L2, bilinguals face a more complex comprehension process involving sentence restructuring mechanism to activate and integrate their L2 than when they read a L2-L1 switched sentence.

Using the eye-tracking technique, which measures the time participants' eyes fixate on a given word during reading, they found that processing difficulty was correlated to the number of fixations (for reading times see Dussias 2003; Altarriba et al. 1996). Altarriba et al. (1996), for example, found that bilingual speakers experience more difficulty integrating code-switches when the context leads to anticipate highly expected information. Conversely, lower frequency conditions lead to more time to resolve conflict (slower processing) facilitating conflict costs with code-switch.

In sum, the majority of previous studies on code-switching using the SPR have mainly focused on the effect of directionality of the switch and L2 proficiency on

bilinguals' reading times. In this study, our focus is syntactic structure and, instead of looking at CS directionality, we aimed to test whether Spanish L2 learners are able to recognize grammatical vs. ungrammatical CS based on the FHC. We used the SRP method to study whether grammatical syntactic structure of code-switched sentences can have an effect on the comprehension and will be reflected in the reading time costs.

Only one other study, to our knowledge, has come up with a similar on-line task to test the validity of the FHC: Dussias (1997). Recall that, as discussed in chapter 2, Dussias' study conducted a series of response-contingent sentence matching tasks to test the FHC predictions on Spanish-English bilinguals. The author found that the reading time data did not support the FHC predictions. In fact, she found that participants took less reading time to read items involving ungrammatical switches (switches between a functional head and its complement) than grammatical ones. A relevant difference between our study and hers lies on the fact that we collected our data with a SPRT instead of a Response-Contingent Matching Task.

We conducted the SPR method to elicit second language learners' intuitional data and examine their processing costs when reading code-switched utterances. Using the self-paced reading task to study intrasentential code-switching grammaticality provides significant knowledge into CS comprehension. This different approach to code-switching grammaticality brings new light not only into CS knowledge but also into second language literature.

4.2 SPRT Research Questions and Hypotheses

Question 1: Is there a cost in the L1 English/ L1French-Spanish bilinguals' processing of grammatical vs ungrammatical CS, as assessed by the SPRT?

(a) Grammaticality: Are reading time values of grammatical CS correlated to the syntactic constraints as predicted by the FHC?

Following the FHC (Belazi et al, 1994), switches between non-functional heads (Nouns, Verbs, Adjectives and Prepositions) and their complements are structurally grammatical.

Given that reading times are expected to reflect the amount of time that participants need to process a segment, it is hypothesized that when comparing the reading times for grammatical code-switched segments vs ungrammatical ones, the former will involve shorter reading times, evidence of a processing facility (Jegerski, 2014). That is, participants will process more rapidly grammatical CS sentences.

(b) Ungrammaticality: When comparing reading times, do participants evidence delay in processing ungrammatically mixed-language sentences?

Slower processing reading times are expected for the ungrammatical switches as defined by the FHC. The FHC (Belazi et al, 1994) states that switches that take place between functional elements and their complements (i.e. Modals/Auxiliaries and their complements; between Quantifiers and their complements; between Negation and its complements; and between

Complementizers and their complements) are structurally ungrammatical/unacceptable switches.

Assuming the FHC is correct, given that longer reading times reflect difficulties in processing (Jegerski, 2014), segments with ungrammatical switches will entail difficulties in processing and this will induce longer reading times at or after the point of the ungrammatical switch segment. This will show that processing of switches after functional heads is more costly for participants due to the difficulty of processing an ungrammatical switch.

Question 2: Is language proficiency a factor in L1 English/ L1 French-L2 Spanish learners CS in the reading time values?

Following Toribio (2001a), we hypothesize that participants' proficiency will be a factor in their processing reading times for the SPRT.

Question 3: Do L1 English-L2 Spanish bilinguals perform differently than L1 French-L2 Spanish bilinguals with regard to subjects' reading times of CS sentences?

We hypothesize that both groups will behave differently given that French L1 learners are more familiar with the CS phenomenon (see previous chapter).

4.3 Materials

This test was used to explore the syntactic constraints proposed by the FHC as well as the effect of L1 in the Spanish L2 learners. Specifically, the Self-paced Reading Task (SPRT) examined participants' reading times at the precise switch boundary.

Therefore, the reading times (RT) in this test are defined as the amount of time, measured in milliseconds, needed to process the regions of a given sentence while reading. Example (5)

(5) Los ciclistas – deberían wear – a helmet – for safety. (Spanish-English)
'Cyclists – should wear – a helmet – for safety.'

The reading times in this task correspond to the interval of time between application of a CS string *deberían wear* 'should wear' (the stimulus), and the detection of participants' comprehension response, that is the moment where the participant proceeds to read the next segment in the sentence *a helmet*. The SPRT provides two types of data: intuitive data and real-time processing data.

4.3.1 Participants

Participants were invited to take part in a study of language processing in their L1 (English / French) and Spanish. It is important to note that most of these participants are not the same as those used for Experiment 1.

For this experiment, we recruited students who were attending Spanish content-courses at the University of Western Ontario in London, Ontario and at the University of Ottawa in Ottawa, Ontario (see Table 4.1 in subsection 4.3.2 below). All of the participants acquired Spanish in a formal setting and had travelled and lived in Spanish speaking countries. There was no specific mention to CS in the recruitment. L1 English and L1 French learners of Spanish were solicited through an invitation email at the respective universities.

4.3.1.1 L1 English participants

In order to be qualified to participate in this experiment, participants were to be L1 English learners of Spanish. The total of English-speaking learners (n = 32) were undergraduate students enrolled at the University of Western Ontario in London, Ontario (a mainly Anglophone city) and were attending Spanish content-courses. The task was conducted in a classroom with computer stations on the campus of the university. Participation was voluntary and since informants were students registered in a Spanish course they received a bonus mark in the course for their collaboration. The age of participants ranged from 20 to 35 years old at the time of testing (mean age = 28).

4.3.1.2 L1 French participants

Similar to the L1 English group, the L1 French group included undergraduate students enrolled at a University in Ottawa, Ontario and all of them were attending Spanish content-courses. They were solicited through an email invitation. The screening and experimental test was conducted individually with the researcher in a quiet study room with a computer station on the university campus. Respondents in this group participated in the experiment voluntarily and received monetary compensation. The age of participants ranged from 22 to 36 years old at the time of the testing (mean age = 29).

All of the participants were born in Canada and had begun learning Spanish in a formal setting and after puberty. All of them had travelled and lived in Spanish speaking countries. None of the participants were habitual code-switchers from their L1 into Spanish. However, the Francophone speakers were more familiar with the CS

phenomenon since Ottawa is a bilingual city and CS between English and French is common.

4.3.2 Proficiency test

Participants' level of Spanish was established by using the proficiency task, developed at McGill University, that has become a standard in L2 Spanish testing (see Duffield & White, 1999; Duffield, White, Bruhn de Garavito, Montrul, & Prévost, 2002) Participants who scored between 0 and 20 out of 50 were considered L2 beginners, between 21 and 39 out of 50 were considered intermediate, and between 40 and 50 were considered advanced (as reported in Table 4.1). Hence, the L1 English group consisted of beginners (n=12) and intermediate (n=20) Spanish learners while in the L1 French were classified as intermediate (n=12) learners of Spanish.

Table 4.1: L2 Spanish Learners Participants by L1 and proficiency (Experiment 2)

Spanish Proficiency Level (P) / **L1**	**Beginner (0-20)/50**	**Intermediate (21-39)/50**
L1 English (n=32) Avg. age: 28 Age of participants ranged from: 20 to 35 Avg. age of Spa L2 acquisition: 18 Level of Spanish classes taking at the university: *Beginner-Intermediate*	n=12 Mean P=18	n=20 Mean P=36
L1 French (n=12) Avg. age: 29 Age of participants ranged from: 22 to 36 Avg. age of Spa L2 acquisition: 16 Level of Spanish classes taking at the university: *Intermediate*	*N/A*	n=12 Mean P=34

Originally we had a slightly bigger number of participants in both L1 groups. However, in order to have homogeneity with regard to participants' Spanish proficiency, some subgroups were excluded since they had too few participants to make valid comparisons. In particular, we did not take into account data a total of 10 participants (n=10) with the following characteristics:

- *L1 French individuals:* who scored as beginners (n=3) and advanced (n=4) in the Spanish proficiency test.
- *L1 English individuals:* who scored as advanced learners (n=3) in the Spanish proficiency test.

As a consequence, we cannot compare across different proficiency levels for both L1 English and French participants separately, the only level at which it is possible to compare the two groups with each other is at the intermediate level.

4.3.3 Testing protocol

The researcher obtained approval from the coordinator of the Language Departments at both universities to distribute the invitation. The researcher also obtained written approval from the participants. An ethical approval protocol is attached in Appendix F.

All participants completed the following tests:

1- Screening Tests: a consent form, a language background questionnaire, and a Spanish proficiency task.
2- Experimental test: A SPRT
3- Experimental test: An Acceptability Judgment Task (reported in section 4.6 of this chapter)

After completing the screening tests, participants were given instructions about the SPRT. The completion time, for all the experiment, was between 1.5 hours and 2 hours. Participants also performed an Acceptability Judgment Task that is reported in the next section 4.6.

4.3.4 Method and procedures

Instructions were presented in English/French by a bilingual experimenter. Prior to testing, participants were instructed that they would read sentences with a language switch from Spanish into their L1 (English / French). At the beginning of the SPRT, participants were also warned that none of the items in the test were either intended to test their L2 proficiency level nor were they a prescription of how well they should use language.

The SPRT was built and run on Linger software (Rhode, 2001) using script-based experiment. All participants were tested individually on a Windows XP Intel® Pentium® 4CPU computer. The experiment began with the participant pressing a key to start the presentation of a brief introduction and instructions and then the presentation of the practice sentences and the test. At the beginning of the experiment, participants completed a 5 sentence trial for practice to familiarize themselves with the procedure. Subsequently, the 48 items were presented in 2 blocks separated by a pause.

Trials began with a fixation marker, "+", followed by a participant-initiated phrase-by-phrase presentation of the sentence (see Fig. 4.1). The cue was displayed in isolation towards the left side of the screen where the first letter of the first segment

appeared. The function of the fixation marker was to encourage participants to look at the position of the first word of the first segment in each sentence before they appeared. This reduces the possibility of participants expending reading time on another part of the screen when the sentence begins to appear.

After the cue and the initial pressing on the spacebar, participants read through a given sentence one region at a time. A first segment of a sentence appeared on the computer screen, participants read it at their own speed. Once they finished reading the segment, participants pressed the spacebar to indicate when they were ready to read the next segment. They repeated this process until the end of the sentence, which was indicated with a period. To advance from the fixation marker and between each region participants pressed the spacebar.

They were instructed to read the sentences by regions silently. All sentences appeared in random order and by regions on the screen.

Press space bar to start	(Initial fixation marker, until button press)
+	(Until button press)
Esos ciclistas -------- -------- -------- --------.	(Until button press)
-------- -------- deberían wear -------- --------.	(Until button press)
------- -------- -------- -------- safety helmets.	(Ending fixation marker, until button press)
+	

Figure 4.1: Example trial in self-paced reading task (Participants pressed a button to advance between regions. After each button press, the next region appeared on the screen)

The SPRT was designed with a non-cumulative linear format[5] in which segments appear in linear succession from left to right without overlapping. Hence, only one segment was visible at a time and every time a new segment was presented the previous one is masked with dashes on the screen. This configuration allows participants have a sense of how far they have left to read within a sentence, but they cannot re-read the sentence. We opted for this SPRT format since stimulus segments presented this way makes reading more similar to typical reading for participants.

Participants pressed the spacebar to move through the sentence segments while the computer software recorded the reading time (reading times; RTs) from the onset of the presentation of the target region to the onset of the presentation of the last segment in each sentence. Time spent on each region between button presses was measured in milliseconds (ms) and was used as the dependent measure. Sentences were displayed on

[5] Note that the appearance and location of the elements displayed in self-paced reading tasks can be formatted in different ways. Regarding how test items are presented, SPR tasks can be (a) cumulative (every time a stimulus segment is presented to participants it stays visible until the full sentence is shown on the display screen) or (b) noncumulative (only one segment is visible at a time and every time a new segment is presented the previous one is hidden from the display on the screen). Stimuli can also be located either in (a) a centered display (every segment appears in the center of the screen and overwrites the preceding segment) or (b) in a linear manner (segments become visible in linear succession from left to right without overlapping).

the screen in black text (Calibri font, size 14) on a gray background, since this color is easier on the eyes than for example a white background.

Subjects read a total of 70 sentences, 48 experimental sentences and 22 distracters. At the end of the sentence, there was either (a) a fixation marker to signal the start of the next sentence or, (b) after every 10 sentences, there was a comprehension which required participants to give their answers by selecting one of the three available options (6) and (7).

(6) Comprehension question for the L1 French test:
L'étudiant a laissé le chien enjoué **sous el árbol** en el parque.

Où l'étudiant a laissé le chien enjoué?

a) chez lui
b) dans le parc
c) dans la voiture

(7) Comprehension question for the L1 English test:
The student left the playful dog **underneath del** árbol en el parque.
Where did the student leave the playful dog?

(a) at his home
(b) in the park
(c) in the car

This accompanying task encouraged participants' engagement in comprehension more than form. In addition, the comprehension question responses allowed us to collect accuracy data from each participant's individual button presses.

Participants were instructed to read the sentences at their own pace, aiming to successfully understand the meaning of each sentence. Therefore, their answers to the random comprehension questions would depend on their level of comprehension and attention. The questions were displayed in full on a single screen and there was no time limit for responding. After completing the online task, participants filled out a language background questionnaire.

4.3.5 Conditions tested in Self-paced Reading Task

We tested seven grammatical conditions and their counterparts (detailed in Table 4.2 below). The test tested 7 conditions (switch boundary types) with 8 stimuli (items per switch type), except the switches after preposition and adjective categories which had 4 stimuli items each. The test contained a total of 48 tokens (sentences) and 22 distracters.

We divided the sentences in segments, i.e. phrase by phrase segmentation, as we wanted to maximize the level of detail in the reading time data for the precise segment where the code-switch occurred, i.e., the critical region. In the design of the experimental stimuli we included exactly the same number of regions and similar length of the segment for all items.

Conditions were counterbalanced across groups according to a Latin square design to form minimal pairs. Eight different CS were constructed (switch grammaticality and language direction), such that all combinations of CS appeared equally often across the test. The computer randomized the order of presentation of the different types of sentences and distracters. The complete list of sentences is found in appendix C.

Table 4.2: Experiment stimuli classified by switching type tested

Conditions: Switch Boundary	Grammaticality	Stimuli per condition (Critical region highlighted)
Aux-VP (n=8)	G	L'avocat **peut abandonner** el caso por la tarde del jueves. The lawyer **might abandon** el caso por la tarde del jueves. 'The lawyer **might abandon** the case on Thursday afternoon.'
	U	* L'avocat **peut abandonar** el caso por la tarde del jueves. *The lawyer **might abandonar** el caso por la tarde del jueves.
Complementizer/TP (n=8)	G	Il est le journaliste **que enseña** el taller de periodismo. He is the journalist **que enseña** el taller de periodismo. 'He is the journalist **that teaches** the journalism workshop.'
	U	*Il est le journaliste **qui enseña** el taller de periodismo *He is the journalist **that enseña** el taller de periodismo.
Neg. (n=8)	G	Sin embargo, los niños **ne regardent pas** le film sur ces ours. Sin embargo, los niños **do not watch** the film about those bears. 'However, the kids **don't watch** the movie about those bears.'
	U	* Sin embargo, los niños **no regardent pas** le film sur ces ours. *Sin embargo, los niños **no watch** the film about those bears.
Quant. (n=8)	G	Mes amis ont **deux livres** sobre la historia de América. My friends have **two books** sobre la historia de América. 'My friends have **two books** on American history.'
	U	* Mes amis ont **deux libros** sobre la historia de América. * My friends have **two libros** sobre la historia de América.
Conj. (n=8)	G	Les enfants **chantent y bailan** una canción después de la clase. The children **sing y bailan** una canción después de la clase. 'The children **sing and dance** a song after class.'
	U	*Les enfants **chantent et bailan** una canción después de la clase. *The children **sing and bailan** una canción después de la clase.
Prep (n=4)	G	L'étudiant a laissé le chien enjoué **sous el árbol** en el parque. The student left the playful dog **underneath del** árbol en el parque. 'The student left the playful dog underneath the tree in the park.'
	U	*L'étudiant a laissé le chien **enjoué debajo** del árbol en el parque. * The student left the playful **dog debajo** el árbol en el parque.
Adj. (n=4)	G	Le maire, **heureux con la noticia,** llamó a su asistente. The mayor, **happy con la noticia,** llamó a su asistente. 'The mayor, happy with the news, called his assistant.'
	U	*Hier soir, **l'heureux alcalde** llamó a su asistente. *Last night, **the happy alcalde** llamó a su asistente. 'Last night, the happy mayor called his assistant.'

Both the sentences and each of their segments were carefully designed to have similar length in the number of words and syllables.

4.4 Results

As described in the method section, the purpose of the SPRT was to test for the participants' grammar knowledge on code-switching. Participants were asked to read a set of CS sentences displayed by regions on the screen, both grammatical switches (n=24) and ungrammatical switches (n=24). The time they took was registered by the computer. There were a total of 48 target CS sentences and 22 filler sentences. We designed two versions of the test: (a) one version was testing English-Spanish CS sentence processing for the L1 English participants and (b) the other version was designed to examine the processing time of French-Spanish CS in the French L1 participants. In the following sections, results will be provided for this task for both groups of L2 Spanish learners.

In contrast to the other experimental tasks in this thesis, in which we used StatView for Mac for the statistical analysis, the data obtained from the SPRT experiment was analyzed using Statistical Software Package for the Social Sciences (SPSS) (IBM Corp, Version 24.0). For all analyses, the statistical model used to analyze the variables was the Analysis of Variance (ANOVA) in the cases where we compared means between two or more groups. Thus, we run this analysis on the raw data, with the within-participants factor Type (grammatical/ungrammatical) and the between-participants factor Groups (L1 English L2 Spanish beginners/ L1 English L2 Spanish Intermediate/ L1 French L2 Spanish Intermediate). This factor was treated as a within-participants factor in the item analyses.

Before turning to the analysis we will briefly touch on the question of data that were excluded.

Outliers

Prior to analyzing the SPRT data, performance on the comprehension questions was evaluated. The data of two participants in the L1 English group were discarded since they performed with an accuracy rate below 75%.

Prior to running analysis of the reading time data, we carried out data trimming in order to minimize the effects of data points that seemed unrelated to language processing factors, such as participants' distractions during the SPRT. Trimming allowed us to identify and remove extreme data points, i.e. outliers. For this, we removed responses that fell 2 standard deviations away from an individual's mean per segment that was analyzed (Table 4.3), affecting 4.9% of the total data. This is a standard procedure in this type of experimental study (see Ratcliff, 1993; Jegerski, 2014; Marsden et al., 2018). Therefore, data from 2 participants in the L1 English intermediate group was removed.

Table 4.3: Percentage of outlying data removed (i.e. responses that fell 2 standard deviations away from an individual's mean)

Groups		**Percentage of outlier responses**
English L1	Beg (n=12)	1.42%
	Int (n=20)	2.17%
French L1	Int (n=12)	1.37%

4.4.1 Experimental results

As mentioned in the methodology section, the SPRT contained both grammatical and ungrammatical CS sentences and we expected to find a difference in the RTs between them. Table 4.4 displays the overall results for the three participant groups. The results in this figure are grouped according to grammaticality to show how the groups performed overall.

Table 4.4: Mean RTs in milliseconds (SD is given in parentheses) to CS items across grammatical and ungrammatical segments

Groups	CS Type	Grammatical CS	Ungrammatical CS
English L1	Beg (n=12)	1537.05 (501.25)	1562.46 (615.88)
	Int (n=18)	1428.72 (342.11)	1505.68 (355.71)
French L1	Int (n=12)	1510.55 (429.28)	1495.78 (409.65)

The data in Table 4.4 show that L1 English-L2 Spanish beginners took on average 25.41 ms more when processing ungrammatical switches than grammatical switches, which is a negligible number. In contrast, the L1 English Intermediate speakers took around 76.96 ms longer in processing them. The L1 French intermediate group does not seem to show any difference between the two types of sentences, in fact the averages go in the wrong direction.

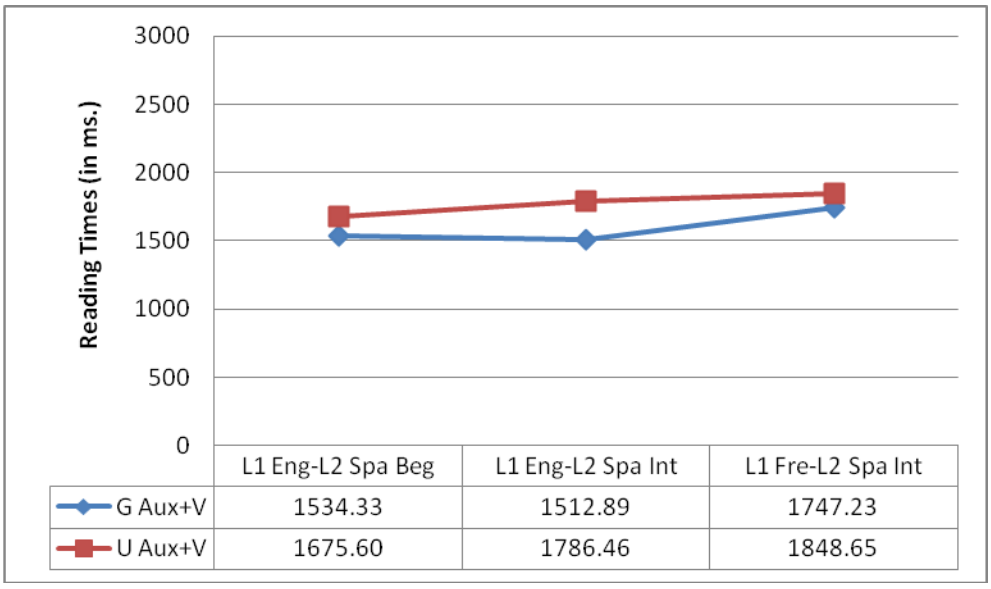
Nevertheless, a one-way repeated-measures ANOVA shows that the groups were not significantly different from each other, F (2, 41) = .039, p = 0.9616. There is,

however, a significant difference between responses to the different conditions, F (13, 41) =9.896, p =0.0001. There was an interaction between groups and condition F (26, 533) = 2.007, p =0.025.

We now examine each grammaticality contrast in turn, as we did in experiment 1. A Table that summarizes the reading time means at the relevant code-switch boundaries with standard deviations is included in the Appendix D.

We conducted paired sample t-tests between the reading times in the different conditions for each of the groups. We will comment on the results as we examine each grammaticality contrast in detail.

4.4.1.1 Switches at the modal/auxiliary boundary



	L1 Eng-L2 Spa Beg	L1 Eng-L2 Spa Int	L1 Fre-L2 Spa Int
G Aux+V	1534.33	1512.89	1747.23
U Aux+V	1675.60	1786.46	1848.65

Figure 4.2: Mean reading times per grammaticality in the Modal/Auxiliar – Verbal Phrase condition

Previous studies have shown strong intuitions about the ungrammaticality of switches between a modal/auxiliary and verb. That is not the case here. The English L1 beginners and the French intermediates show a very slight tendency in the right direction. This tendency is stronger for the English intermediate group. However, the paired sample T-Test shows no significant difference between grammatical vs. ungrammatical response times for any of the groups. It may be interesting to note that the French group seems to take longer than the English groups in general.

4.4.1.2 Switches at the negation boundary

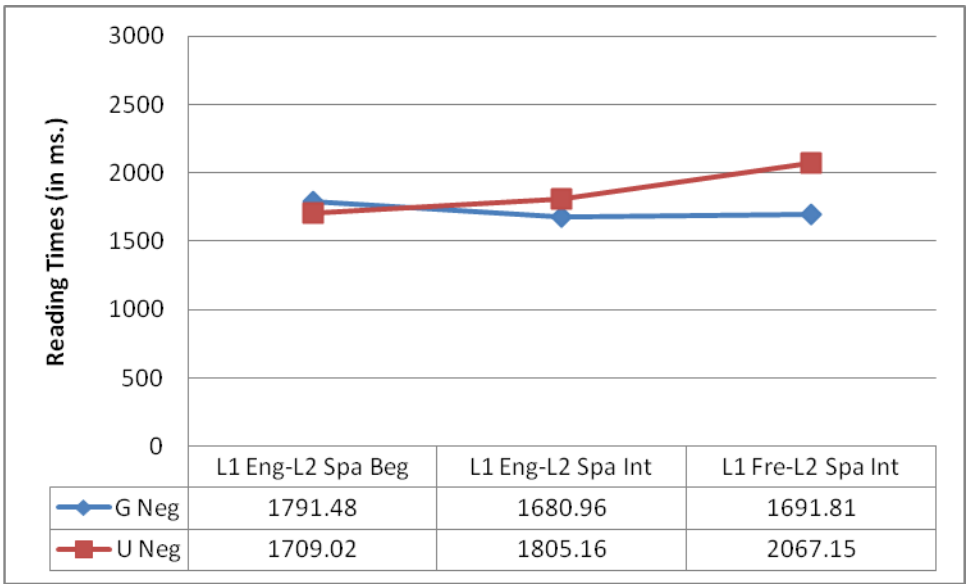


Figure 4.3: Mean reading times per grammaticality in the Negation – Complement condition

The Beginners group clearly does not differentiate between grammatical and ungrammatical switches in their reading times; in fact the tendency is to be slightly faster in the ungrammatical cases. The tendency to distinguish grammaticality is stronger in the intermediate group, and the best performance in relation to the expected outcomes is the French speaker group. However, the paired sample T-Test again shows no significant difference between grammatical vs. ungrammatical response times for any of the groups.

4.4.1.3 Switches at the quantifier boundary

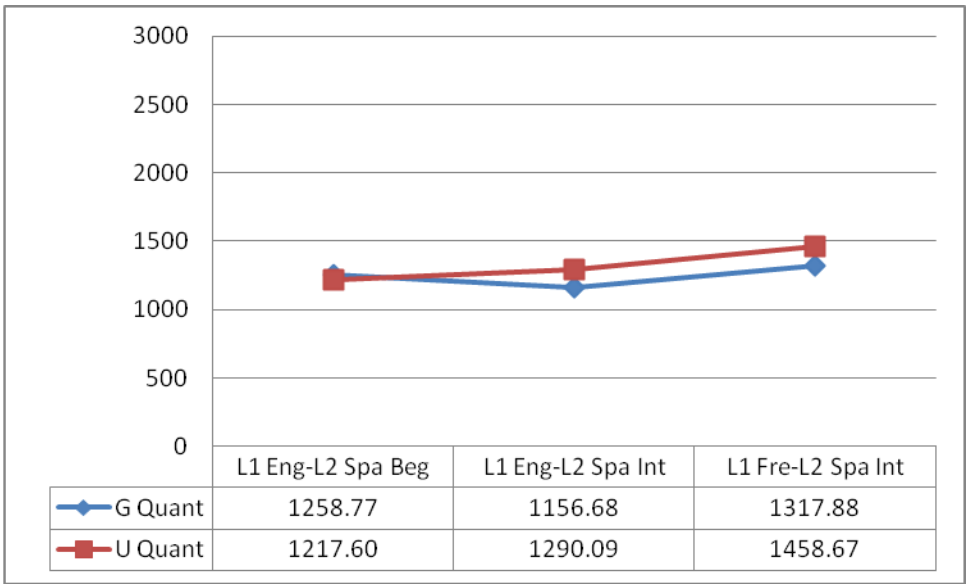


Figure 4.4: Mean reading times per grammaticality in the Quantifier – Complement condition

It is clear from Figure 18 that neither of the English groups' reading times distinguish between grammatical and ungrammatical sentences. Visually, it would seem that nor do the French speakers. However, their responses actually do reach significance: $p = 0.027$.

4.4.1.4 Switches at the complementizer boundary

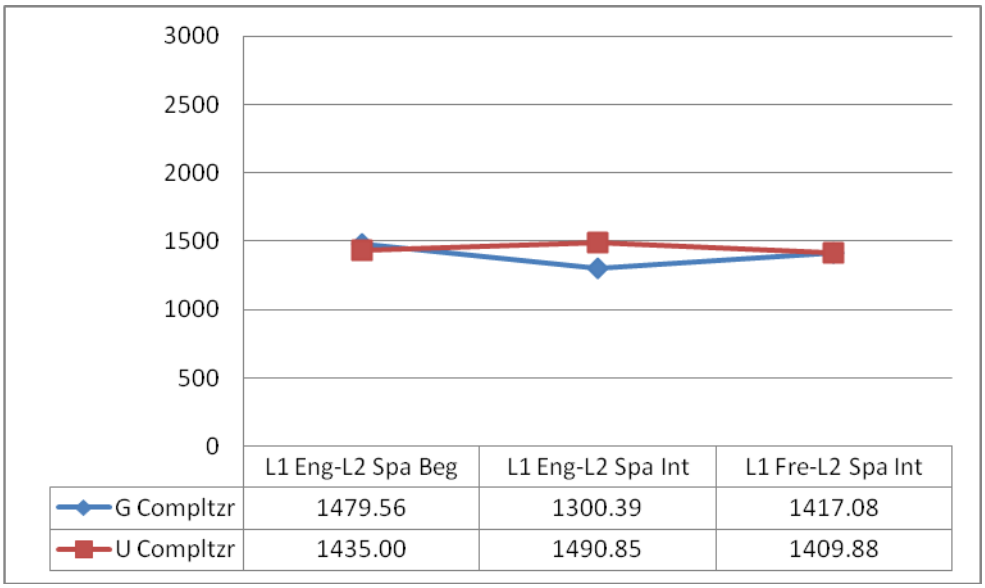


Figure 4.5: Mean reading times per grammaticality in the Complementizer – Complement condition

The English intermediate group may be moving in the right direction, but again none of the groups show statistical significance in relation to grammaticality.

4.4.1.5 Switches at the conjunction boundary

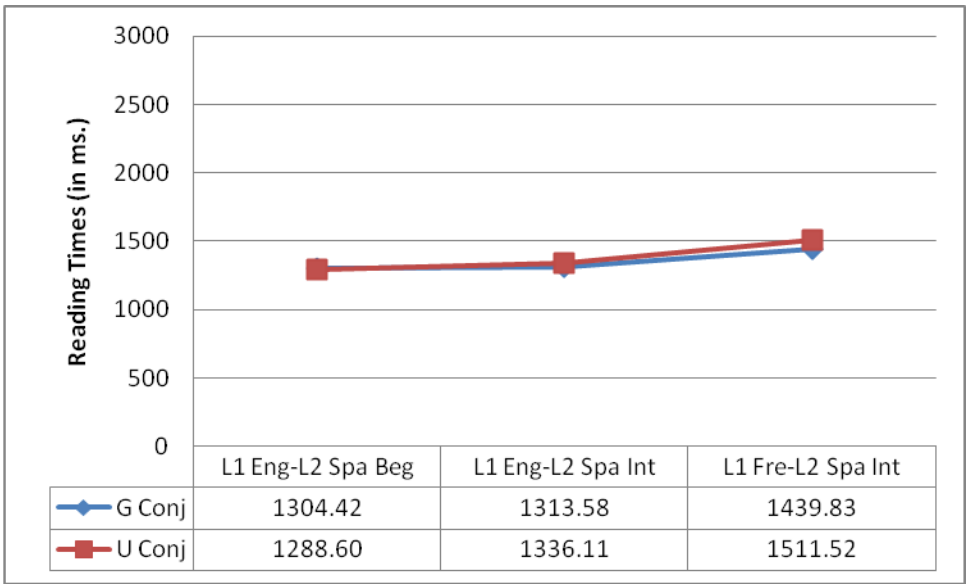


Figure 4.6: Mean reading times per grammaticality after a Conjunction

No study, as far as we know, has looked at switches before and after a conjunction. It is a well-known principle of grammar that conjunctions always join equivalent phrases; in fact this property leads to their use as a constituency test. Unfortunately, none of the groups exhibit any tendency to distinguish grammatical and ungrammatical switches around a conjunction.

4.4.1.6 Switching at the preposition boundary

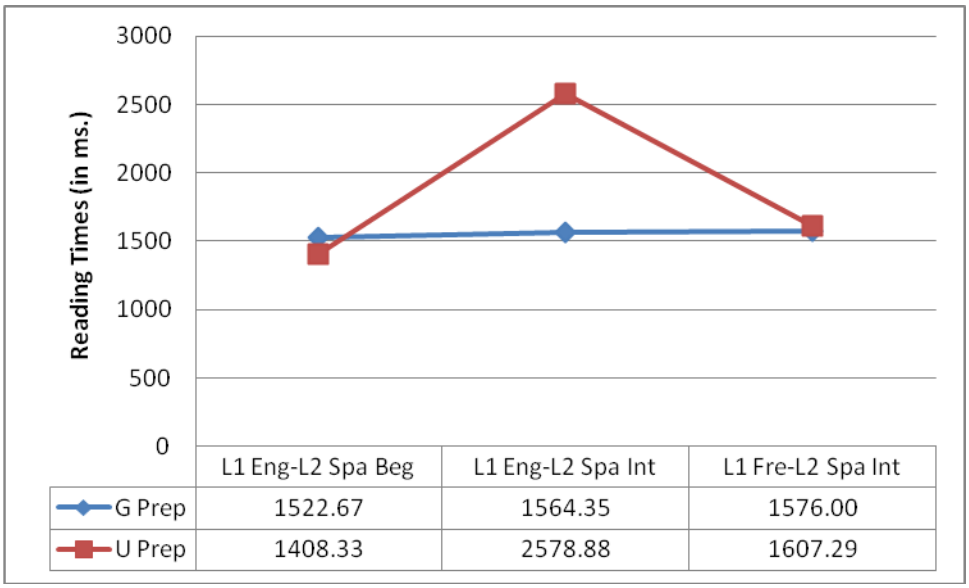


Figure 4.7: Mean reading times per grammaticality after a Preposition condition

The English intermediate group sticks out because for the first time grammatical and ungrammatical mean response times are evidently different. This difference reaches significance: $p = 0.023$.

4.4.1.7 Switches at the adjectival boundary

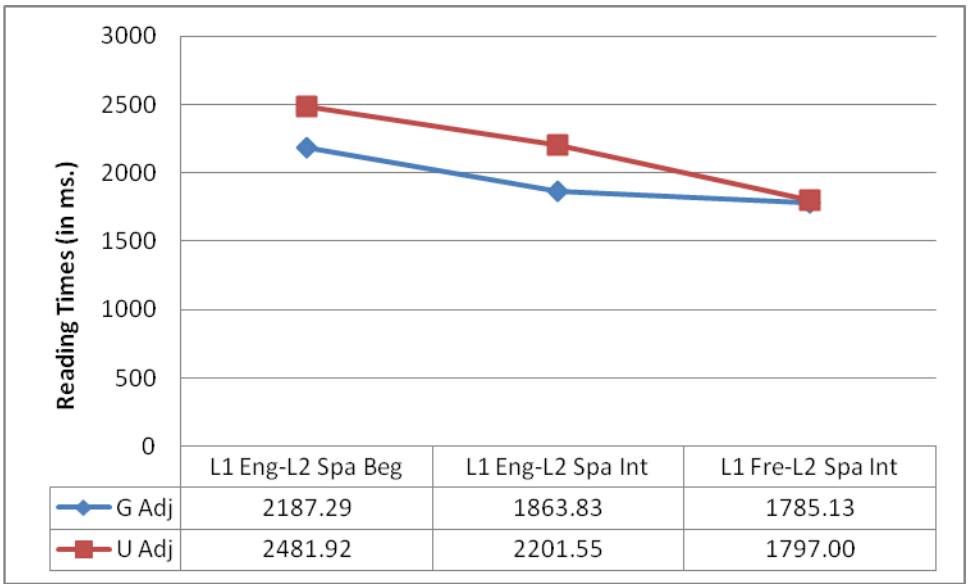


Figure 4.8: Mean reading times per grammaticality after an Adjective condition

Both the English L1 groups show a tendency in the right direction, unlike the French group. However, there is no significant difference in reading times for any of the groups.

In the next section I will discuss the findings of the Self-paced Reading Task.

4.5 Discussion

The present experiment sought to test whether subjects were able to recognize code-switching grammaticality as predicted by the Functional Head Constraint (Belazi et al., 1994). Therefore, since we are looking at linguistic intuitions, the SPRT provided two types of significant data: intuitional and real time processing data. It was expected that regions including a grammatical CS would involve faster reading times than the ones

involving an ungrammatical CS. Specifically, we assumed that CS stimuli that included a switch between a lexical category and its complement would show shorter RTs as they would be more rapidly read and processed. On the contrary, RTs of the sentences that violated the FHC predictions, that is, where switches lay between a functional head and its complement, were expected to lead to significantly higher reading times since the CS at these junctures should take longer for the reader to process. With these principles in mind, the present SPRT aimed to observe how L1 English and L1 French learners of Spanish read sentences that contained un/grammatical intrasentential CS.

The first thing to note is the lack of significant difference between the three groups. In most cases, we do not find French L1 speakers and English L1 speakers performing in a different way. We must conclude, as we did in Experiment 1, that the L1 of the learners is not a significant factor in knowledge of the constraints on code-switching. Of course, other languages should be tested to determine how universal these constraints are.

For the case of the L1 English groups, the lack of significance between the groups also reproduces the results of Experiment 1 in showing that proficiency does not play a major role in code-switching except in some specific cases. Reading times also show that the different contrasts are not all acquired at the same time, although the constraints, as proposed by the FHC, are overarching. It is possible that we have to examine each boundary to see how it relates to the mental lexicon, which would be consistent with Minimalist approaches to sentence building (Chomsky, 1995). We will explore this idea in depth in chapter 5.

However, we must also point out that, although no significant difference was found between grammatical and ungrammatical switches in relation to reading times, in the majority of cases there is a tendency to process ungrammatical switches more slowly.

Focusing on each minimal-pair CS type showed that there were slightly larger switching costs in the participants' reading times when the switching was syntactically ungrammatical.

We now discuss the SPRT results in relation to our research questions and hypotheses:

Question 1: *Is there a cost in the English/French-Spanish bilinguals' processing of grammatical vs ungrammatical CS, as assessed by the SPRT?* Although it may be premature, and clearer contrasts may be found if larger groups of participants are tested, we do believe that tendencies were present, tendencies that generally moved in the directions predicted by the FHC.

Question 2: *Is language proficiency a factor in English/French L1-Spanish L2 learners CS in the reading time values?* We did not find L2 proficiency to be a significant factor influencing participants' reading times. Thus, no correlation was found between proficiency in L2 Spanish and reading time cost.

Taking the RTs in the SPRT as an indicator of CS processing, the results of this study do not clearly support Toribio's (2001a) assertion that the level of competence of the participants will be a significant factor in their judgment of the un/acceptability of CS.

Question 3: *Do English L1-Spanish L2 bilinguals perform differently than French L1-Spanish L2 bilinguals with regard to reading times of CS sentences?* We did not find that participants' L1 had a significant effect on the RTs. A possible explanation is the Spanish proficiency placement test that we used. Due to the syntactic and lexical similarities between French and Spanish, we believe that this test may not work as well for French and may not accurately represent the abilities of the francophone participants in Spanish. It is interesting that in Experiment 1 the French speakers seemed more aware of the constraints on code-switching than the English L1 speakers who had placed at the same level, while in the present experiment this was not the case. Given that (a) French and Spanish share a large number of lexical elements and structures, and (b) the placement test that we used is based on approximately 60% of vocabulary, these aspects may have resulted in the participants obtaining a better score in their Spanish placement test than their L1 English-Spanish learner peers. It is therefore possible that French-speaking participants with an intermediate level of Spanish are more equivalent in their L2 Spanish level to the beginner participants in the English-speaking group.

That the test did not yield the statistical results we expected may be due to the fact that larger numbers of participants in the groups are needed. Since the reading measurement is made in milliseconds, it would be optimal to have larger samples in order to better observe the differences between the groups and categories. It is noticeable that the French and English beginner groups gave such similar results in many cases, and both groups were relatively small, 11 and 12 participants.

The SPRT allowed us to explore the general research question of how grammatical knowledge/intuitions and language processing are related in judgment of CS sentences by focusing on processing during reading comprehension. Moreover, with this method we can further explore how second language learners judge CS appropriateness in real-time.

As we mentioned previously, additional approaches for future studies may consist of further examination of the SPRT with more participants to take advantage of its capacity to produce relevant language processing data. In a future project we could compare the findings from this SPRT with a self-paced listening experimental task to analyze potential divergences in comprehension between reading and listening code-switched sentences.

The following section presents the acceptability judgment task in Experiment 2.

4.6 Acceptability Judgment Task (minimal pairs)

The FHC holds testable predictions regarding the grammaticality and ungrammaticality of CS which is subject to the switch juncture (after a lexical vs. a functional head). In the present dissertation, we directly contrasted sentences that reflected (or not) the structures derived from such predictions in order to examine these predictions. In this thesis we conducted two experiments: (a) Experiment 1 consisted of an AJT created by Toribio's (2001a) and (b) Experiment 2 comprised of two experimental tasks: a self-paced reading (SPRT) and an acceptability judgment task (AJT). Both of them examined the predictions from the FHC controlling for the switch

juncture in each. Using different methodologies, we wanted to have a more complete interpretation of L2 learners' grammatical judgment on CS. As in Experiment 1, we prepared two versions of this task written in the language of the participants. The AJT administered to the L1 English group controlled for the switch boundaries of English-Spanish CS in each token while the AJT presented to the L1 French group examined different switch junctures of French-Spanish CS sentences.

Although Toribio's (2001a) study is an unparalleled pioneer for the study of CS in L2 learners and it yielded highly important results, we found that the test itself had some strong aspects as well as some shortcomings. From the results we had in Experiment 1, we decided to create a new AJT that could benefit from the positive characteristics of Toribio's AJT test while improving certain limitations. In the design of the novel AJT, we opted for keeping the model in which participants could rate CS acceptability by choosing between a pair of sentences. After reading each sentence pair, participants were asked to judge whether one of the two phrases sounded more natural than the other, whether both sounded natural or whether neither of the two sentences sounded possible.

(11) *AJT items for L1 English participants*

(a) The coach said *que estaba contento con ellos.* (English-Spanish)
(b) *The coach said that *estaba contento con ellos*
'The coach said that he was pleased with them.'

(a) *El entrenador dijo* that he was pleased with them. (Spanish-English)
(b) **El entrenador dijo que* he was pleased with them.
'The coach said that he was pleased with them.'

(12) *AJT items for L1 French participants*

(a) L'entraîneur a déclaré *que estaba contento con ellos.* (French-Spanish)
(b) * L'entraîneur a déclaré qu'il *estaba contento con ellos*

‘The coach said that he was pleased with them.’

(a) *El entrenador dijo* qu'il était satisfait d'eux. (Spanish-French)
(b) **El entrenador dijo que* il était satisfait d'eux.
‘The coach said that he was pleased with them.’

In examples (11) and (12), in line with the FHC, we expected participants to choose (a) as the acceptable switch instead of (b), given that sentences where the switch occurs after a lexical head, as the verb *said* in (11a), are predicted to be acceptable for participants. On the other hand, switches after a functional head such as the complementizer *that* in (11b) are predicted to be considered not acceptable by participants.

We keep this design which we consider more optimal than tests based on an acceptability scale such as the Likert scale. This type of scale can give more limited results since the values on the evaluation scale used to measure the degrees of acceptability will depend exclusively on the subjectivity of each participant. This means that asking the participant to evaluate the acceptability of a statement based on a scale of, for example, 1 to 5 (where 1 is the least acceptable and 5 is the most acceptable) will have a different value for each participant. Participants’ ratings will not be precise because their criteria will differ from person to person and therefore the test will produce somewhat biased data.

An aspect that we wanted to improve in the present AJT was the number of sentences examining the different types of CS junctures. The AJT in Experiment 1 had an uneven number of items representing each CS boundary type. For example, for some CS

categories such as switches after prepositions (n=3) and adjectives (n=2) there were so few tokens that it was not possible to gather enough data to examine acceptability. Besides cases with few CS types, the first AJT also had sentence pairs that did not mix acceptability values as much as possible. To give an example, switches between subject/predicate (n=2) for which both items were grammatical, there were no ungrammatical tokens, and switches after the functional head negation (n=2) for which tokens included exclusively non-grammatical switches. As a result, it was not possible to compare acceptability rating between grammatical and ungrammatical sentences for each tested CS category.

In view of these limitations, the redesigned AJT consisted of a series of minimal pairs whose only difference was in the point where the switch occurred (examples 11 - 12 above). Having minimal pairs gives more control on the analysis for the different CS types in relation to both acceptable and non-acceptable switches. Therefore, the test had a similar number of items for both grammatical and ungrammatical switches of the same switching boundary. For example, there were 8 sentences with switches between the modal/auxiliary and the verbal phrase boundary, with half of them representing sentences with grammatical switches (n=4) and the other half corresponding to sentences with ungrammatical switches (n=4) at the switch juncture.

Additionally, we added a CS juncture to the test: switches after conjunctions. To our knowledge, there is no other study that has examined the acceptability of CS that includes this type of category (13) and (14):

(13) *AJT items for L1 English participants* (English-Spanish)

(a) The children sing *y bailan una canción después de la clase.*
(b) *The children sing and *bailan una canción después de la clase.*
'The children sing and dance a song after class.'

(14) *AJT items for L1 French participants* (French-Spanish)
(a) Les enfants chantent *y bailan una canción después de la clase.*
(b) *Les enfants chantent et bailan una canción después de la clase.
'The children sing and dance a song after class.'

4.7 Research Questions and Hypotheses

This AJT looks at whether L1 English/L1 French-L2 Spanish learners acquire the knowledge that defines structurally grammatical coherence in code-switching which allows them to render accurate judgments for permissible switched forms.

In order to test both English-Spanish CS and French-Spanish CS, acceptability judgments based on the FHC predictions we proposed the following questions:

1. Since classroom L2 learners are typically not in contact with CS, will their performance lend support to the FHC?

We hypothesize that participants will distinguish between acceptable and unacceptable code-switches. That is to say, learners are able to recognize the structural restrictions on L2 CS in spite of no or very little input.

2. The FHC (Belazi et al, 1994) predicts that switches between non-functional heads (Nouns, Verbs, Adjectives and Prepositions) and their complements are

structurally grammatical. Do L1 English/French Spanish learners accept or reject switches after these lexical items?

According to Toribio (2001a), L1 English/French Spanish learners will accept these grammatical switches between lexical categories and their complements.

3. Following the FHC (Belazi et al, 1994), unacceptable switches take place between functional elements and their complements (i.e. Modals/Auxiliaries and their complements; between Quantifiers and their complements; between Negation and its complements; and between Complementizers and their complements). Do L1 English/French Spanish learners accept or reject a code-switch after a functional item?

Based on Toribio's (2001a) findings, it is anticipated that both L1 English/French L2 Spanish learners will reject these ungrammatical functional element switches.

4. Is language proficiency a factor in L1 English/French Spanish learners CS judgments?

Our prediction is that participants' proficiency level will be a significant factor in their CS un/acceptability judgments, in line with Toribio (2001a).

5. Do L1 English L2 Spanish bilinguals perform differently than L1 French L2 Spanish bilinguals with regard to CS judgments?

To the best of our knowledge no other authors have compared CS judgments of L1 English and L1 French Spanish learners; therefore we tentatively forecast that both

groups will behave differently given that French is structurally closer to Spanish than English.

4.8 Materials

We look into L2 Spanish learners' judgments on code-switched sentences using this questionnaire which consisted on minimal pairs (n=24). As outlined in the previous subsection, we prepared two versions of this task testing switches between participants' L1 and Spanish. Therefore, the AJT administered to the L1 English group controlled for the switch boundaries between English and Spanish CS in each token while the AJT presented to the L1 French group examined different switch junctures between French and Spanish CS sentences.

Table 4.5: Experiment stimuli classified by switching type tested (AJT with minimal pairs)

Conditions: Switch Boundary	**Grammaticality**	**Stimuli per condition (Critical region highlighted)**
Aux-VP (n=8)	G	Every semester, the students **han visto** la película en el auditorio. Chaque semestre, les étudiants **han visto** la película en el auditorio. 'Every semester, the students have seen the movie in the auditorium.'
	U	*Every semester, the students **have visto** la película en el auditorio. *Chaque semestre, les étudiants **ont visto** la película en el auditorio.
Complementizer/TP (n=8)	G	The students **que viven** aquí pueden empezar. Les étudiants **que viven** aquí pueden empezar. 'The students that live here may start.'
	U	*Los estudiantes **que live** here may start. * Los estudiantes **que habitent** ici peuvent commencer.
Neg. (n=8)	G	My brothers **have not read** el cuento escrito en inglés. Mes frères **n'ont pas lu** el cuento escrito en inglés. 'My brothers have not read the story written in English.'
	U	*My brothers **have not leído** el cuento escrito en inglés. *Mes frères **n'ont pas leído** el cuento escrito en inglés.

Quant. (n=8)	G	She bought **three books** en la librería. Elle a acheté **trois livres** en la librería.. 'She bought three books in the bookstore.'
	U	*She bought **three libros** en la librería. *Elle a acheté **trois libros** en la librería..
Conj. (n=8)	G	I prefer **cats y perros** que sean muy activos. Je préfère des **chats y perros** que sean muy activos. 'I prefer cats y and dogs that are very active.'
	U	*Yo prefiero los **gatos y dogs** that are very active. *Yo prefiero los **gatos y chiens** qui soient actifs.
Prep (n=4)	G	L'étudiant a laissé le chien enjoué **sous el árbol** en el parque. The student left the playful dog **underneath del** árbol en el parque. 'The student left the playful dog underneath the tree in the park.'
	U	*L'étudiant a laissé le chien **enjoué debajo** del árbol en el parque. * The student left the playful **dog debajo** el árbol en el parque.
Adj. (n=4)	G	The student **interested in the subject** escucha la clase. L'étudiant **intéressé par le sujet** escucha la clase. 'The student interested in the subject listens to the lesson.'
	U	***L'étudiant interesado** escucha la clase. ***The student interesado** escucha la clase. 'The interested student listens to the lesson.'

As shown in Table 4.5, we tested seven conditions of switch types. The test contained 48 tokens (24 grammatical switches and 24 ungrammatical switches), with eight sentences per switch type except for the preposition and adjective conditions that had four sentences each. Conditions were counterbalanced across groups according to a Latin square design to form minimal pairs. Eight different CS were constructed (grammatical switch vs ungrammatical switch, language direction, i.e., English-Spanish/Spanish-English and French-Spanish/Spanish-French), Tables (4.6) and (4.7), such that all combinations of CS appeared equally often across the test.

Table 4.6: Minimal pairs in AJT for L1 English participants

English-Spanish	Spanish-English
There are some students *que toman el bus a las 4pm*.	*Aquí hay unos estudiantes* that take the bus at 4pm.
*There are some students that *toman el bus a las 4pm.*	**Aquí hay algunos unos que* take the bus at 4pm.

'There are some students that take the bus at 4pm.'

Table 4.7: Minimal pairs in AJT for L1 French participants

French-Spanish	Spanish-French
Il y a des élèves *que toman el bus a las 4pm*.	*Aquí hay unos estudiantes* qui prennent l'autobus à 16h.
*Il y a quelques élèves qui *toman el bus a las 4pm.*	**Aquí hay algunos unos que* prennent l'autobus à 16h.

'There are some students that take the bus at 4pm.'

All of the target items and the distracters were randomized in the questionnaire. Similarly to the SPRT, the sentences were also carefully written to have similar length in the number of words in order to control attention to the switch boundary. The complete task is found in Appendix C.

4.9 Participants

Participants were the same groups described in the previous experimental task, the SPR, section 4.3.1

4.10 Method and procedures

As in the other tasks conducted in this dissertation, instructions were presented to participants in English and French by a bilingual experimenter. Prior to testing, they were instructed that they would read sentences with a language switch between Spanish and their L1 (English / French). At the beginning of the AJT, participants were also warned that none of the items were intended either to test their Spanish L2 proficiency level or were they a prescription of how they should use language.

4.11 Results

As defined earlier in this section, the main objective of the AJT in Experiment 2 was to examine participants' acceptability judgments for different types of grammatical and non-grammatical CS statements. In the test, participants read a pair of sentences, one of which had a grammatically switch while the other sentence presented an ungrammatical switch, based on the FHC. Participants were then asked to choose from four possible options, in the same fashion as in Experiment 1. The alternatives were: (1) whether sentence *a* sounded better than sentence *b*, (2) whether sentence *b* seemed more native-like than sentence *a*, (3) whether both sentences appeared acceptable to them, or (4) whether neither sentence sounded correct. Table 4.8 below shows the overall mean results for all the CS boundaries tested.

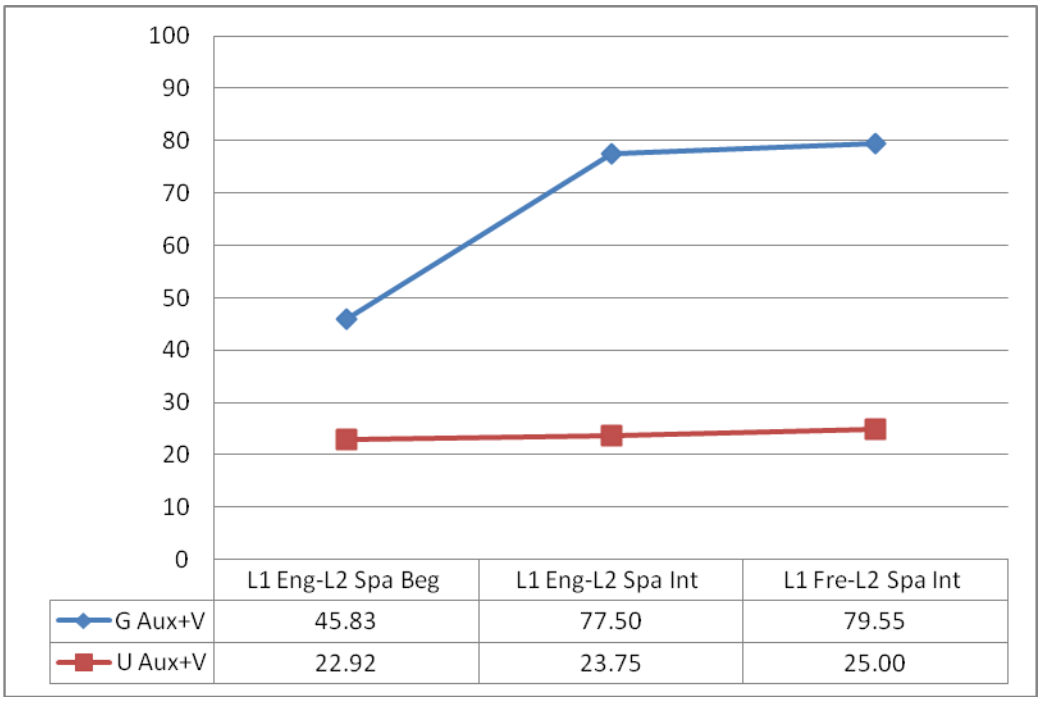
Table 4.8: Mean of rate of Acceptability for the seven CS boundaries tested (Standard Deviation is given in parenthesis)

	Aux+V		Neg		Quant		Compltzr	
	G	U	G	U	G	U	G	U
L1 Eng-L2 Spa Beg (n=12)	45,83 (33,43)	22,92 (22,51)	60,42 (31,00)	29,17 (27,87)	25,00 (35,36)	20,83 (31,68)	64,58 (36,08)	22,92 (22,51)
L1 Eng-L2 Spa Int (n=20)	77,50 (19,70)	23,75 (22,18)	65,00 (26,16)	37,50 (19,02)	45,00 (35,91)	36,25 (35,79)	66,25 (32,72)	17,50 (23,08)
L1 Fre-L2 Spa Int (n=12)	79,55 (21,85)	25,00 (29,58)	86,36 (17,19)	25,00 (25,00)	79,55 (31,26)	34,09 (32,16)	75,00 (22,36)	31,73 (31,82)

	Conj		Prep		Adj	
	G	U	G	U	G	U
L1 Eng-L2 Spa Beg (n=12)	52,08 (34,47)	31,25 (30,39)	20,83 (25,75)	41,67 (35,89)	41,67 (35,89)	66,67 (38,92)
L1 Eng-L2 Spa Int (n=20)	53,75 (32,72)	37,50 (32,95)	30,00 (34,03)	60,00 (20,52)	67,50 (33,54)	60,00 (34,79)
L1 Fre-L2 Spa Int (n=12)	72,73 (26,11)	45,45 (33,20)	63,64 (39,31)	50,00 (22,36)	72,73 (26,11)	45,45 (35,03)

A one-way repeated-measures ANOVA was used to calculate the significance of L1 English and L1 French group responses across the seven CS categories, and their interaction. The results show that there is a significant difference between the groups, F (2, 40) = 4.082, p = 0.0244, as well as between the categories, F (13, 26) = 16.521, p = 0.0001. Additionally, there is a significant effect for the interaction between language group and CS categories, F (26, 520) = 2.115, p = 0.0012. This contrasts with the results in the AJT in Experiment 1 and with the SPRT.

4.11.1 Switch at the Modal/Auxiliary boundary



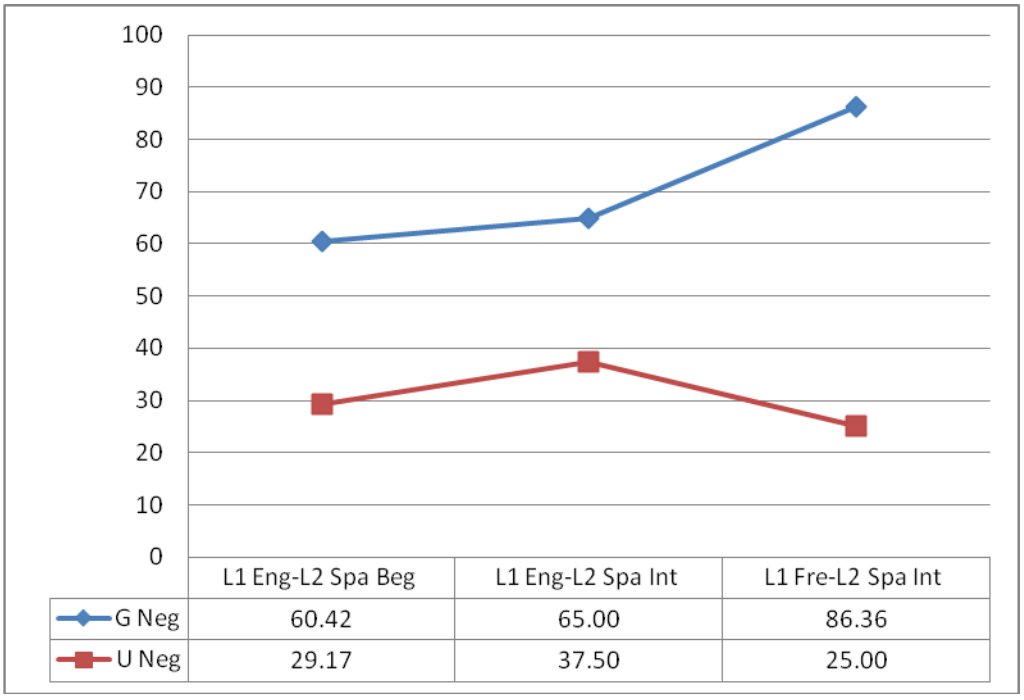
	L1 Eng-L2 Spa Beg	L1 Eng-L2 Spa Int	L1 Fre-L2 Spa Int
G Aux+V	45.83	77.50	79.55
U Aux+V	22.92	23.75	25.00

Figure 4.9: Mean acceptance rates for Modal/Auxiliary – Verbal Phrase boundary code-switch for each language group

Overall, we can see (Figure 22) that the participants greatly favored grammatical phrases in their judgments. The rejection of non-grammatical phrases is unmistakable with a 22-25% rejection rate. A factorial repeated-measures ANOVA, with group (L1 Eng beginners, L1 English intermediate, L1 French intermediate) and modal/auxiliary-verbal phrase CS (grammatical, ungrammatical) as factors show a significant main effect of group, F (2, 40) = 7.453, p = 0.0018.

Post hoc pair wise comparisons using a Scheffe F-Test shows a significant difference in the performance for the grammatical sentences between the L1 English beginner and L1 English intermediate groups as well as between L1 English beginner and L1 French intermediate. There is no difference between the Intermediate English and French groups. There is no significant difference between the groups for the ungrammatical Mod/Aux-VP CS sentences, confirmation that all the participant groups recognize the ungrammaticality for this CS type.

4.11.2 Switches at the negation boundary



	L1 Eng-L2 Spa Beg	L1 Eng-L2 Spa Int	L1 Fre-L2 Spa Int
G Neg	60.42	65.00	86.36
U Neg	29.17	37.50	25.00

Figure 4.10: Means of acceptability before and after negation for each language group

Judgments regarding grammaticality around negation show all three groups distinguish between possible and impossible switches. This is particularly evident in the

case of French speakers, results that do not conform to those of the SPRT. However, the one-factor ANOVA shows a borderline significant difference between the groups for the grammatical sentences, F (2, 40) = 3.407, p = 0.043 and a post hoc Scheffe F-Test fails to confirm significance between any two groups, although a Fisher PLSD, which is a weaker test, finds that the French group and the English beginners differ. Regarding the ungrammatical sentences, there is no significant difference between the groups, F (2, 40) = 1.145, p = 0.32.

This is interesting since grammatical negation in the three languages is different, as we pointed out in Chapter 2. Spanish does not use auxiliaries to create a negative sentence (15) whereas English does. In English the negation requires adding *not* after an auxiliary or modal verb (16) and a dummy auxiliary for the sentences where there is no auxiliary verb (17). Likewise, standard written French commonly requires two particles to be added both before the verbal phrase (*ne*) and after the verb (*pas*) (18). In informal French, the first part (*ne*) is usually omitted (19).

(15) Yo no hablo español.
(16) I have not spoken Spanish.
(17) I do not speak Spanish.
(18) Je (ne) parle pas espagnol.
(19) Je parle pas espagnol.

Regardless of the syntactic contrast between Spanish and English/French negation, participants are able to recognize the grammaticality of the code-switch. This finding suggests that participants are relying more on their code-switching grammatical intuitions than on a word-by-word translation strategy.

4.11.3 Switches at the quantifier boundary

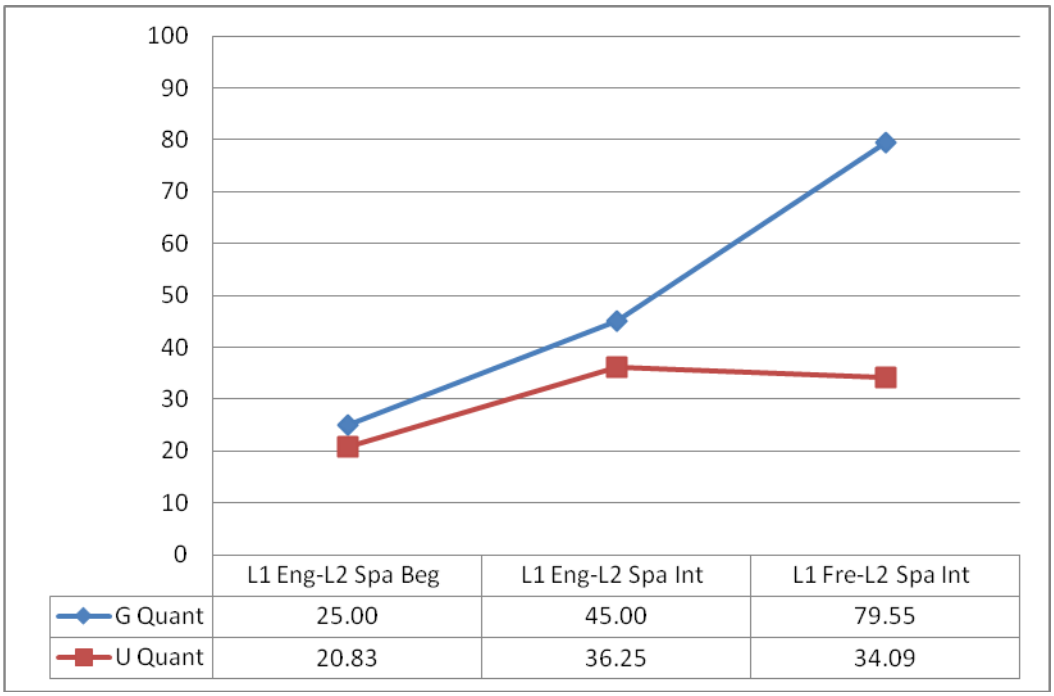


Figure 4.11: Means of acceptability after and before a quantifier for each language group

As the figure shows, the English groups do not accept either the grammatical or ungrammatical switches when a quantifier is involved. For the French speakers there is a clear difference is acceptance. The ANOVA shows a significant difference between the groups, F (2, 40) = 7.276, p = 0.002 for the grammatical sentences. A post hoc Scheffe F-test attributes this to the significant difference between the French group and each of the English groups. Regarding the ungrammatical switches, there is no significance between the groups, all three of them rejecting them equally: F (2, 40) = 0.827, p = 0.44.

4.11.4 Switches at the complementizer boundary

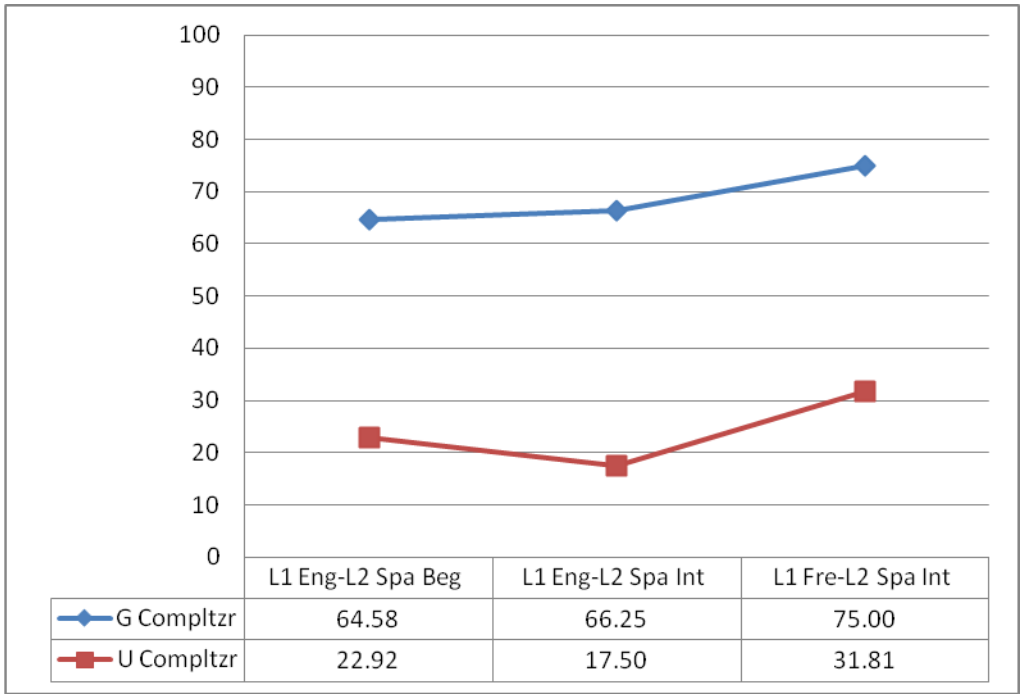


Figure 4.12: Means of acceptability after a complementizer for each language group

It is clear from the graph that all three groups distinguish between acceptable and unacceptable switches around a complementizer boundary. It is also clear there is no difference between the groups either for the grammatical or ungrammatical switches. This is confirmed by the ANOVA, F (2, 40) = 0.373, p = 0.69, for grammatical switches, F (2,40) = 1.128, p = 0.3337 for the ungrammatical.

4.11.5 Switches at the conjunction boundary

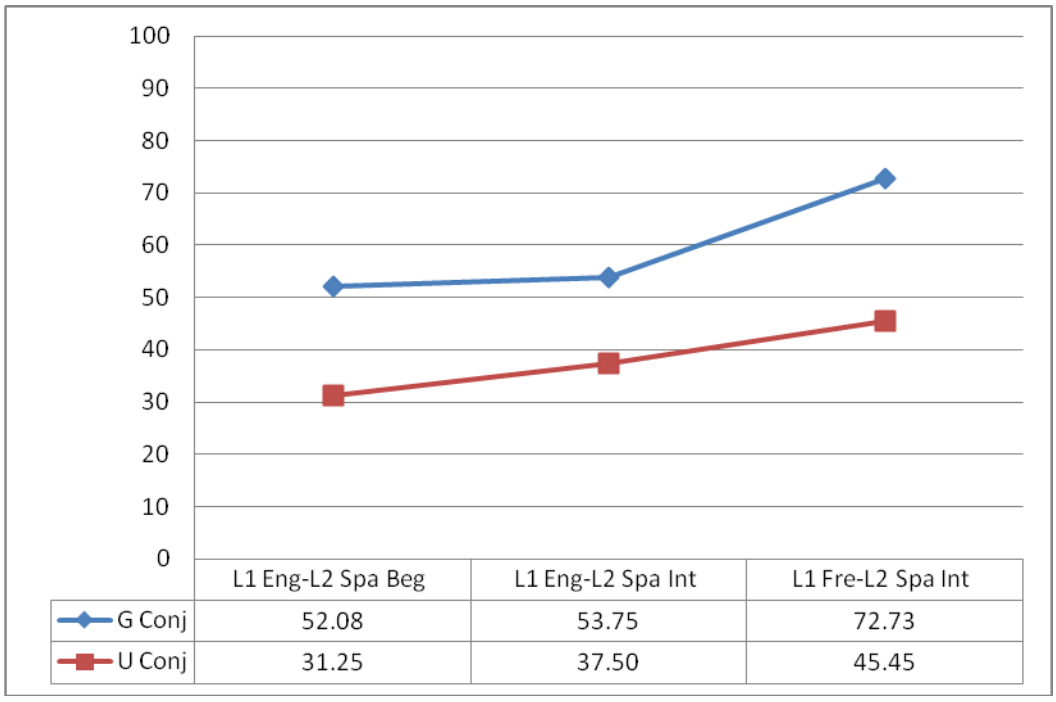
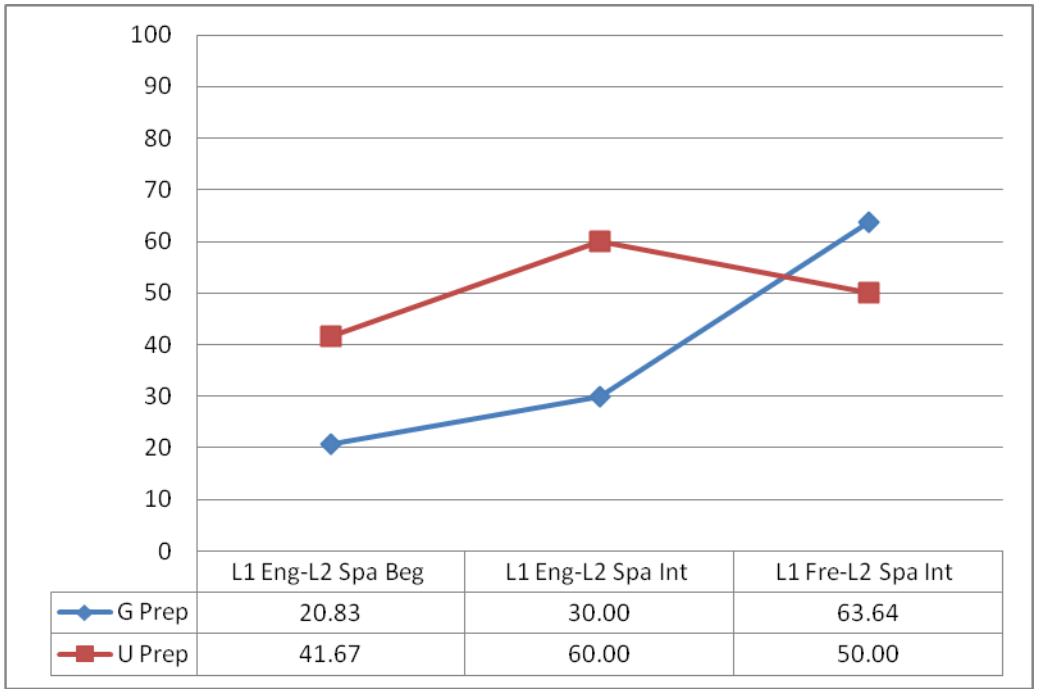


Figure 4.13: Means of acceptability rates after a conjunction for each language group

Neither of the three groups accepts the ungrammatical switches to a high degree. However, the English groups don't seem too enthusiastic about the grammatical switches either. The French group, in contrast, does differentiate between the two to a larger degree, although their acceptance for the ungrammatical is higher than expected.

However, the ANOVA results show no significant difference between the groups for either the grammatical or ungrammatical switches: F (2, 40) = 1.574, p = 0.2198 for the grammatical switches, F (2, 40) = 0.556, p = 0.57.

4.11.6 Switch at the prepositional boundary



	L1 Eng-L2 Spa Beg	L1 Eng-L2 Spa Int	L1 Fre-L2 Spa Int
G Prep	20.83	30.00	63.64
U Prep	41.67	60.00	50.00

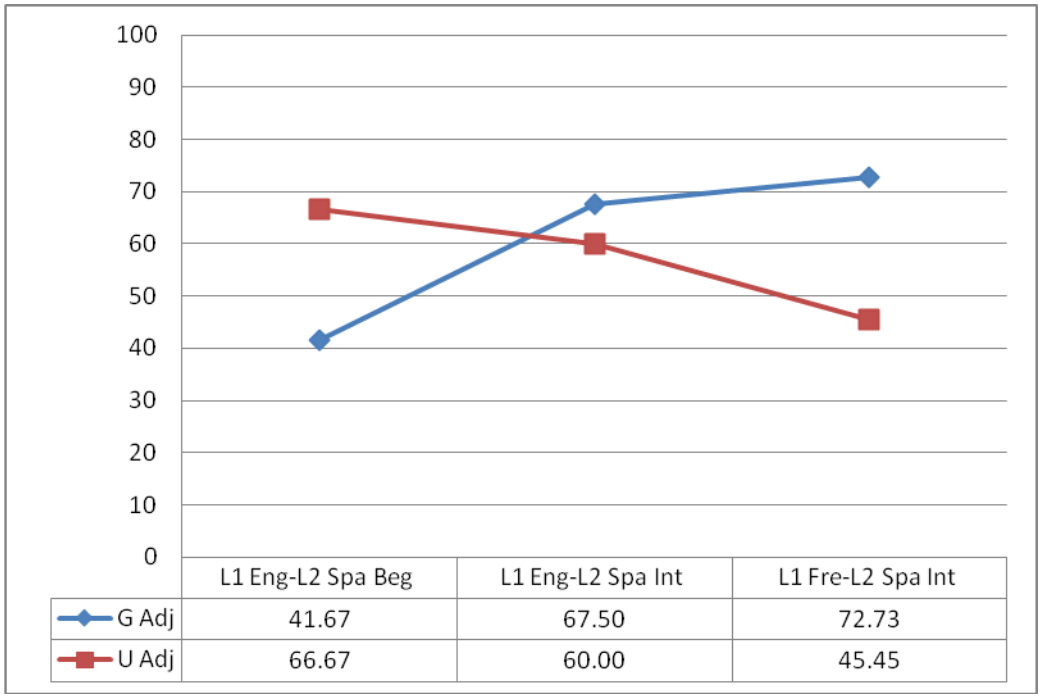
Figure 4.14: Means of acceptability rates after and before a preposition for each language group

Contrary to the acceptability judgment results in all previous switching boundaries, for CS after a preposition, the native English L2 Spanish learners accepted the non-grammatical phrases more than expected and, surprisingly, rejected the grammatical switches. Only the responses of the French speakers showed greater acceptance of the grammatical switches at a rate of 63.64% vs a 50% acceptance of the

non-grammatical ones. We are not sure why but we could speculate that L1 French participants relate the Spanish lexical items to French items. It is important to note that the current test used very different types of prepositions than the ones used by Toribio (2001), which were often phrasal, for example *in front of.* The one factor ANOVA reported a significant difference between the groups for the grammatical switches, F (2, 40) = 5.311, p = 0.009. A Scheffe F-Test shows this difference lies between the French group and the each of the two English groups. There is no significant difference between the groups for the ungrammatical switches, F (2, 40) = 1.915, p = 0.16.

As a final note on these results, as discussed previously in Chapter 2, the status of prepositions, as either lexical or functional elements, is controversial. Perhaps there is something about individual prepositions that has to be further analyzed. In any case, the acquisition of this category is by no means simple and probably has to be broken down into different types of features (Lardiere, 2007).

4.11.7 Switches at the adjectival boundary



	L1 Eng-L2 Spa Beg	L1 Eng-L2 Spa Int	L1 Fre-L2 Spa Int
G Adj	41.67	67.50	72.73
U Adj	66.67	60.00	45.45

Figure 4.15: Acceptability rates around adjectives for each language group

The results of switches with adjectives are unexpected. Beginners accept ungrammatical switches and reject grammatical ones, English L1 intermediates barely distinguish between the two, and only the French group performs as expected. The one Factor ANOVA finds no significant difference between the groups for either the grammatical or ungrammatical switches, although it is borderline for the grammatical ones: F (2, 40) = 3.223, p = 0.0504 for the grammatical switches (a post hoc Scheffe F-test does not signal any difference between the groups), F (2, 40) = 1.044, p = 0.36 for the ungrammatical.

The surprising results could have several explanations. Because the grammatical sentences consist of a postnominal adjective and its complement it is quite possible beginning and intermediate learners have never encountered this type of construction in the L2 and it may not really be common the L1 either. Furthermore, it might be quite difficult to process. Finally, it is possible that English learners of L2 Spanish at this point have not fixed the movement of the noun over the adjective (Cinque, 1994). In contrast, this movement is the same in French, and French and Spanish adjective noun word orders are similar.

4.12 Conclusions

The results from the present AJT in Experiment 2 have demonstrated that both L1 English and L1 French learner groups have overall grammar intuitions about CS that are in line with the FHC. This is more evident in this study than in Experiment 1.

Both intermediate groups demonstrated more accurate acceptability responses than the beginner group. The L1 English beginner participants, as expected, are not clear-cut contrasts as the intermediate groups but generally speaking they do exhibit a preference for the grammatical over the ungrammatical switches. Their responses for code-switches after preposition and adjective showed that beginners have trouble recognizing the un/grammaticality of code-switching in these two particular cases. We can wonder here if acquiring L2 functional categories entails more complexity for L2 learners than acquiring lexical categories, as suggested by Lardiere (2000, 2007, 2009a, 2009b). This idea will be further discussed in chapter 5. This may be an indication that

L2 Spanish proficiency does play a role in their knowledge of CS. On the other hand, both the L1 English and L1 French intermediate responses are more similar. However, they align with the English beginners in their judgments of switches around prepositions and adjectives. In these cases they are more similar to the beginners than to the French group. Regarding the French group, they performed as expected in almost all conditions. Whether this shows an advantage for speakers of other Romance languages will be discussed below.

Chapter 5

5 Discussion and Conclusions

5.1 Introduction

The previous two chapters focused on presenting the two experiments and their results. This chapter presents the conclusions derived from the data discussed in chapters three and four.

Before interpreting our overall results, we remind the reader of our main aims. The goal of this dissertation has been to investigate whether L2 Spanish learners' grammar intuitions on CS show evidence of constraints hypothesized by the Functional Head Constraint proposed by Belazi et al. (1994). Specifically, it investigated the acceptability and real-time processing of switches in two different groups of L2 Spanish learners: native speakers of English and French.

Recall that following the FHC, switches between a lexical head (nouns, verbs, adjectives and prepositions) and their complements may occur naturally in CS while switches between functional heads (modals, auxiliaries, quantifiers, negation, complementizers, prepositions, conjunctions) and their complements are ungrammatical.

The main research question of this study was whether L2 Spanish learners are sensitive to the (un)grammaticality in English/French-Spanish switches following the FHC. To investigate this issue, two different experiments were conducted: in Experiment 1 we carried out an acceptability judgment task that was used in Toribio's (2001a) study.

For Experiment 2 we designed an acceptability task with minimal pairs and an on-line self-paced reading task. We used a quantitative research approach in an effort to obtain an accurate analysis of speakers' grammatical intuitions and processing of CS.

This final chapter discusses the general findings of the two experiments and lays out their contribution to the fields of code-switching grammatical constraints, L2 acquisition, second language teaching, and linguistics in general.

5.2 Summary and Discussion of the Results

The primary research question in this dissertation was: given the typical absence of CS input that classroom L2 learners receive, will their grammar intuitions on CS show evidence of the predictions made by the FHC? In order to answer this question, we performed two experiments and results for each of them are examined below.

5.2.1 Experiment 1: Acceptability Judgment Task – Acceptability rates

The AJT in Experiment 1 was included to examine the grammatical intuitions of L2 Spanish learners: L1 English (n=29) and L1 French (n=22). Based on proficiency test results, participants in this experiment were subdivided into four groups L1 English beginner (n=16) and intermediate (n=13) and L1 French intermediate (n=11) and advanced (n=11) learners of Spanish.

The questionnaire drew on the Acceptability Judgment Task administered in Toribio (2001a) and examined 22 pairs of sentences with twelve different types of switches: five ungrammatical switches and seven grammatical switching boundaries.

Results from this test showed that both L1 English (beginner and intermediate) and L1 French (intermediate and advanced) learners of Spanish had very similar acceptability judgments with no statistically significant difference found between the groups. This is an important finding, which goes against Toribio's (2001) finding that proficiency plays an important role. There are two caveats: (a) we did not have three levels in each of the two languages so results are tentative; and (b), when we look at results of the individual contrasts, the beginners often lag behind.

Overall, this experiment found that L2 learners did indeed distinguish between acceptable and unacceptable code-switches, confirming our hypothesis and consistent with results of previous studies (Toribio, 2001a; Dussias, 2003; Koronkiewicz, 2018; Giancaspro, 2013, 2015). In other words we found that, as predicted by Toribio (2001a), the percentage of acceptance for grammatical switches (i.e. between lexical categories and their complements) was higher than the acceptance rate for ungrammatical switches (i.e. after a functional category). In all groups, participants gave consistently low ratings to ungrammatical switches.

Given the structural and lexical similarity between French and Spanish languages, we were expecting the L1 French participants to give higher acceptability of grammatical switches and stronger rejection and unacceptable CS than the English speaking learners. Experiment 1, with certain exceptions, this was not the case, since both the L1 English and L1 French intermediate groups exhibit parallel sensitivity to the FHC predictions regardless of their L1. However, there were certain contrasts in which only the French

advanced group performed as expected: switches around quantifiers and switches around adjectives. Nevertheless, overall, although French and English are typologically different languages, L1 does not affect participants' sensitivity to recognize grammaticality in CS. Therefore, we conclude that the distinction between lexical and functional categories is not language specific and can be found in structurally different languages. This finding supports Toribio's (2001a) claim that grammatical intuitions on CS are universal to all L2 bilinguals and are not bound to 2L1 bilinguals.

5.2.2 Experiment 2: SPRT & AJT

As in the previous experiment, we sought to test whether subjects were able to recognize CS grammaticality as predicted by the FHC. In this experiment, we used two tasks that gave us two types of experimental data: A SPRT (to look at participants' real time processing) and an AJT (to observe their grammatical intuitions).

We performed Experiment 2 with a new group of L2 Spanish learners, different from those that participated in Experiment 1. Based on proficiency test results, participants in this Experiment 2, L2 Spanish learners, were divided into three groups: L1 English beginner (n=12), L1 English Intermediate (n=20), and L1 French Intermediate (n=12).

5.2.2.1 Self-paced Reading Task – Reading Times

With this task we wanted to examine the reading times of grammatical code-switched sentences which met the FHC in comparison to equivalent sentences that did not, i.e. ungrammatical switches. The test was conducted online and consisted on 48

items testing 8 types of switching boundaries. It measured, in milliseconds, the processing times of the CS stimuli in order to examine whether ungrammatical CS regions would result more costly for the L2 learners than grammatically switched regions. Our prediction was that ungrammatical CS sentences would involve significantly longer reading times than grammatical CS utterances as participants would need more time to process the ill-formed switch.

Overall, there was a slight effect of grammaticality for both L1 English and L1 French L2 Spanish learners' processing, although this effect rarely reaches significance. Most of the ungrammatical CS cases recorded longer reading times than the grammatical ones. There was no statistically significant difference between the three groups, although there was a main effect for sentence type. It is impossible to state with certainty that there was a clear processing cost to ungrammatical code-switches, but the tendency did surface in most conditions.

Regarding proficiency, in some cases, for the L1 English beginner group, reading time patterns highly contrasted with the performance of the other two groups. Contrary to our expectations, L2 beginners' results showed in some cases longer reading times for grammatical CS. This may be an indication that proficiency, at least in the beginning stages, does play a role, although as stated, the difference between this group and the others does not reach significance.

We can conclude until now that L2 learners are able to distinguish correctly grammatical and ungrammatical CS sentences. As predicted, the ungrammatical CS

sentences (switches after functional heads) involved longer reading times than the sentences that meet the FHC. Both the L1 English and the L1 French learners of Spanish were sensitive to the unacceptable conditions in the CS types. In particular, there was a greater processing cost for switches after: (a) negation, (b) quantifiers, (c) complementizers, and (d) an adjectives. Similar patterns of sensitivity were found in the acceptability judgment task. This can be an indicator that some categories are acquired earlier than others. We will provide a more detailed explanation in sections 5.6 and 5.7.

5.2.2.2 Acceptability Judgment Task – Acceptability Rates

This acceptability judgment task investigated L1 English/L1 French L2 Spanish learners' acceptability of CS. The test examined 48 pairs of sentences using minimal pairs at 8 different switching boundaries.

Results showed that L1 English (beginner and intermediate) and L1 French (intermediate) learners of Spanish had very similar acceptability judgments. In this case we do find that there is a significant difference between the groups. These results lend strong support to the predictions made by the Functional Head Constraint. Confirming our hypothesis and in line with the FHC, we found that participants have accurate grammar intuitions about CS. The analysis by group and condition further showed that both the English and French intermediate learners exhibited more accurate acceptability responses than the beginner group and their intuitions as measured by the degree of difference between acceptance of grammatical and rejection of ungrammatical switches was considerably more clear-cut. Both English groups exhibited unexpected responses

with switches around prepositions and adjectives. This is a relevant finding that we will try to explain in the following section 5.7.

Results obtained in both experiments demonstrated that L2 learners treat differently and distinguish grammatical and ungrammatical CS. However, in particular conditions we may find unexpected difficulties.

5.3 Proficiency and L2 Spanish Learners' Sensitivity to Code-Switching Grammaticality

In line with Potowski and Bolyanatz (2012), Giancaspro (2015) and Koronkiewicz (2018), results in Experiment 1 reported here and in the SPRT also show that participants' judgments of grammatical and ungrammatical CS seem to be not correlated to their L2 proficiency level (although see above regarding Beginners), which is backed by the lack of statistical difference between the groups. In both experiments, overall results indicate that participants' L2 Spanish proficiency level is not a significant factor either for CS acceptability judgments or for the reading times in the SPRT. At first glance, this finding contradicts Toribio's (2001a) results. Recall that in her study intermediate and beginner L2 Spanish speakers struggled to distinguish between grammatical and ungrammatical CS whereas advanced L2 Spanish speakers did successfully recognize such distinction. Thus, she concluded that only higher proficiency L2 learners can exhibit native-like CS competence.

So we are faced with a bit of a contradiction: the AGJ in Experiment 1 and the SPRT we reported show no significant difference between the groups, contradicting Toribio's findings. However, the second GJT shows that beginners do indeed fail to make distinctions that intermediate learners make. The explanation may lie in differences in both the use of a placement test and in the methodology. We will address the latter below.

Regarding the first point, it is important to note that our groups' proficiency was not comparable to the level in Toribio's (2001a) groups so comparisons may not be possible. Bear in mind that L2 Spanish learners in her study were classified in three groups based on their semester class enrollment (1st, 3rd and 6th semester students). In our study, instead, L2 Spanish learners were divided into groups based on their performance on a proficiency test. In fact, L1 English-L2 Spanish beginners in both of our experiments were more advanced than Toribio's beginner group since all of them had previously taken up to 2 years of Spanish classes whereas in her study the same level group was enrolled in the first semester of Spanish. Therefore, if we use Toribio's (2001a) classification standards, our beginner L2 Spanish learners would had been probably categorized as L2 Spanish "intermediate" bilinguals in her study. Furthermore, both English and French L2 Spanish learners' background information in our experiments revealed that all participants had a lot of Spanish classroom experience and many had travelled to Spanish speaking countries. Other studies that have also used a standardized proficiency test showed no direct relation between grammatical intuition and proficiency. (Potowski and Bolyanatz, 2012; Giancaspro, 2015; Koronkiewicz, 2018).

Given that our results are not directly comparable with Toribio's and that the reason we constructed the second acceptability test was to solve some problems we found in the first, we will claim that proficiency does play a role based on our Experiment 2. A detailed examination of the different conditions often gave a clear advantage to learners with higher proficiency. In conclusion, we believe this thesis lends support to Toribio's (2001a) finding that L2 proficiency plays a role in second language learners' grammatical intuitions for CS. As Toribio pointed out "bilinguals with a higher degree of balance of competence in the two component languages exhibit a greater sensitivity to the nuances of different code-switching patterns than their less fluent counterparts" (Toribio, 2001a: 226). Therefore, the unexpected results from less advanced L2 Spanish learners corroborate Toribio's claim.

5.4 French L1: is it a Factor on Code-Switching Grammatical Intuitions?

All of our participants were learning Spanish as a foreign language in Canada and none of them were either directly exposed to English –Spanish or French-Spanish code-switching. However, given that some of them speak other languages, the CS phenomenon was likely not something new for them. Interestingly, the L1 French learners were more familiar to this linguistic behavior than the L1 English participants. Therefore, we were expecting that the French natives would show a significantly different separation rate between possible and impossible code-switches in comparison to the English natives for

two reasons: (a) the structural proximity between French and Spanish and (b) their linguistic attitudes towards the CS phenomenon.

In the first AJT task, the French advanced group performed as expected in the four categories where a comparison was possible. The French intermediate performed in a similar fashion to the English intermediate group. Based on this we argued for no L1 effect. The results of the advanced group were attributed to proficiency, with the expectation that advanced English speakers would perform similarly. And in fact the SPRT seemed to confirm this assumption.

However, Experiment 2's AJT showed a clear advantage for the French intermediate learners over the English intermediates. In fact, the French group makes all the relevant distinctions, including the distinctions related to prepositions and adjectives, that the English groups had trouble with. We cannot explain the difference between this intermediate group and the intermediate group in Experiment 1, except to suggest that methodology may have something to do with the results. However, based on these results, it seems to us clear that French L1 speakers may arrive at the relevant distinctions sooner than English speakers. It is not surprising that one of the areas where this was obvious was the switch around adjectives. As we mentioned, adjectives behave in a very similar fashion in French and in Spanish, so these results are not really surprising.

We also assumed that, given that in Ottawa CS is not well accepted (Poplack, 1987); our L1 French L2 Spanish learners would tend to perhaps reject more both acceptable and unacceptable switches. Startlingly, this was not the case. A possible

explanation may be that the biggest manifestation of CS in Ottawa occurs between French and English, and not between French and Spanish. Consequently, French-Spanish switching is something novel for our French speaking participants and they did not transfer the negative attitudes that they may have towards CS to the French-Spanish pair. In fact, attitude does not seem to play a role in our participants' judgments (see Badiola, Delgado, Sande, & Stefanich (2017) for a similar finding). This result is unexpected given that data collected with AJT can be affected by negative attitudes towards code-switching, leading speakers to reject sentences that linguistically can occur. Unfortunately, we did not explicitly include linguistic attitudes as a factor to analyze whether it influences acceptability judgments on code-switching.

5.5 Significance of Methodology

The methodologies in the two experiments allowed us to address the question of L2 learners' CS grammatical sensitivity from two different angles. We wanted to have two different sources of evidence and to systematically collect data in two ways: AJT for intuitions and the SPRT for processing knowledge. Both of these methods allowed us to access L2 learners' intrinsic knowledge on CS without the interference of semantic and pragmatic dimensions of language use. However, as we pointed out in the introduction, the prejudice around code-switching makes it really difficult to collect participants' linguistic intuitions without any effect of their own bias towards CS or any other contextual factors that may affect their answers. Is not uncommon that prejudice towards code-switching can prompt informants to reject more sentences even when they sound

linguistically acceptable to them (Munarriz & Parafita Couto, 2014; Parafita Couto, Deuchar & Fusser, 2015; Anderson, 2006; Giancaspro, 2013).

Additionally, we chose to conduct the self-paced reading methodology since reading time records provide intuitive data about L2 learners' grammatical knowledge. We assumed that ungrammatical sentences would take longer to process than grammatical ones. However, we found that this was not always the case and that there was no significant difference between the groups. A possible explanation is that processing difficulties can arise not only from ungrammaticality but also from other factors not related to CS, such as syntactic or lexical aspects. The results obtained in this task are rather inconclusive: all of the groups of L2 learners behaved similarly and seemed to have some problems in processing even grammatical switches. We wonder whether these results show that a self-paced reading task is not a suitable way to measure L2 learners' grammatical competence on code-switching.

Regarding the acceptability tasks, we selected this method in order to assess L2 learners' intuitional grammatical knowledge on CS. For Experiment 1, the results from the AJT were somehow uncertain since Toribio's (2001a) test did not have minimal pairs and in some cases the categories were tested with only one example. Therefore, we decided to design a different AJT for Experiment 2 with detailed attention to have minimal pairs and to test evenly the different categories. We strongly believe that the improvements we made on the AJT led to the clear and significant results. We would like to argue here that improvements are always possible in any study and it is important for

results to be validated. This comes up against the well-known fact that publishing studies whose aim is to improve and validate results is sometimes difficult. At the same time, although most studies try to use more than one method of testing a particular property, this is not always the case, and it is important because certain results may be tied directly to a particular methodology.

5.6 Functional Categories in L2 Learners' Grammar Sensitivity

In both experiments, L2 learners struggled to recognize ungrammatical switches, i.e. switches after functional categories. Therefore, we could ask whether L2 acquisition of functional categories is not a straightforward process. Instead, L2 learners need to realize what functional categories and what features are present in the L2, and in so doing, they must "distinguish and recombine the morphological expression of individual features from the way these are realized in the native language" (Lardiere, 2007: 237), as predicted by the Feature Reassembly Hypothesis (FRH) (Lardiere, 2009a, 2009b). The FRH explains that, in second language acquisition, L2 learners try to establish a direct mapping between L1 and L2 forms that may involve L1 transfer of certain linguistic properties as an initial attempt to map concepts in L2. However, when a direct initial mapping is not possible, L2 learners gradually reorder the L1 grammatical system in an effort to match the L2. Consequently, in the cases of lexical/functional categories, L2 learners will transfer lexical categories and parameters associated with them (for example, headedness) while for functional categories learners may have to ascertain the

relation between them and morphology, and the way the features work. This is where, for example, the importance of verb and noun movement may play a role in CS phenomena. The functional element T may exist in language A, but it may not 'attract' the verb, a lexical category, while in another language it does. This is one difference between Spanish and French on the one hand, and English on the other.

Since remapping implies a "complex process of re-assembling the relevant features from the way they are conditioned and realized in the L1 to that of the L2" (Lardiere, 2007: 241), in general, participants in the two experiments had difficulty assessing grammaticality in switches after functional categories since these switches demand from them to relearn the association between functional heads and their complements. For example, in the case of auxiliaries, L2 learners need to remap the relationships between the verb and the auxiliary and their syntactic consequences in the L2. Therefore, L2 learners may need to acquire what the functional categories are in the L2 language and perhaps this is not as obvious as one thinks because of factors such as morphological realizations of the different elements.

5.7 Prepositions: Lexical or Functional Categories in L2 Acquisition?

The Functional Head Constraint predicts switches between prepositions and their complements to be grammatical. Interestingly, we found that in the two experiments participants had difficulties identifying both grammatical and ungrammatical switches after prepositions. What could explain the contrasting intuitive judgments that L2

learners have about code-switching after a preposition? Is it possible that prepositions may represent a functional category for L2 learners?

Since results showed neither a clear rejection of ungrammatical CS utterances nor a strong acceptance of grammatical CS for switches after prepositions, we wonder whether prepositions represent functional categories instead of lexical elements (Baker, 2003). This idea would explain why so many learners did not clearly distinguish grammaticality in this type of switch. We also wonder if Spanish L2 students acquire prepositions as functional categories. Thus, they need to learn the prepositions and associate them with the verbs (the lexical items). This is particularly the case given that the correspondence is not always one to one: *on top of* vs. *sobre*, for example.

Results confirm that L2 acquisition of prepositions is by no means simple given their semantic, syntactic and phonological features. If prepositions are acquired as functional elements, then the complexity in L2 acquisition explains L2 learners' struggle in recognizing the grammaticality in switches after prepositions. In general, we cannot expect that L2 learners acquire everything at once. Instead, we agree that L2 acquisition happens gradually and, in fact, this is what our results have shown.

5.8 Conclusions

The results in this dissertation contribute to our understanding of L2 learners' linguistic knowledge on CS structural grammaticality. We tested the Functional Head Constraint's (Belazi et al., 1994) predictions in L1 English and L1 French L2 Spanish learners. In line with Chomsky's Minimalist model (Chomsky, 1991, 1992), the FHC

claims that switching between a lexical head and its complement is allowed whereas switching between a functional head and its complement is not.

The results obtained in this dissertation would further benefit from including a larger number of participants. We are aware that increasing the sample size can strengthen the statistical power of our results. In particular, the self-paced reading methodology calls for larger participant groups. Since the reading measurement is made in milliseconds, a bigger sample would allow a more fine-grained analysis within groups as well as switching categories.

As we mentioned in the introduction, we also elicited L2 Spanish learners' language attitudes towards oral code-switching in a matched-guise task. In a future project, we would like to combine the results of this task with the results presented in this dissertation.

The findings of our research have shown L2 learners' CS knowledge, evidence of their knowledge of unconscious linguistic principles (Toribio, 2001a), despite the fact that CS is not taught (explicitly or implicitly) in an L2 classroom. We believe that L2 learners' code-switching knowledge could be exploited in their language learning process in educational settings. Unfortunately, traditional language teaching encourages the use of the target L2 language in the classroom and the avoidance of L1 for a successful language acquisition (Littlewood, 1981; Lee and VanPatten, 2003). We believe that code-switching could be used in creative ways, for instance in written and oral activities,

to take advantage of their intrinsic linguistic knowledge and enhance students' L2 learning, instead of keeping it away from them.

In conclusion, the results obtained in this dissertation support Belazi et al.'s (1994a) FHC predictions and contribute to our understanding of L2 learners' CS structural knowledge. Confirming our main hypothesis, L2 learners consistently differentiated between grammatical and ungrammatical switches. We found that L2 learners were sensitive to CS syntactic constraints as defined by the FHC in both experiments. L2 learners' grammatical intuitions on intrasentential CS demonstrate their intrinsic knowledge of grammatical principles.

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Appendices

Appendix A: Acceptability Judgment Task, French-Spanish code-switching version (Experiment 1)

Tâche de jugement d'acceptabilité

Instructions

Vous trouverez dans les pages suivantes une liste de paires de phrases. Ces phrases impliquent une alternance codique entre l'espagnol et le français à différents moments de la phrase. Il est possible que vous n'ayez jamais entendu ou lu ce type de phrase, mais vous pouvez vous faire une opinion sur ce qui vous semble acceptable.

Après avoir lu attentivement chaque paire de phrases, indiquez si l'une des phrases, les deux ou aucune d'entre elles vous semblent acceptables. Veuillez donner votre réponse initiale à la série de phrases. Là encore, lisez attentivement chaque phrase avant de répondre. Ensuite, cochez l'espace approprié:

- ✓ a si (a) vous semble acceptable;
- ✓ b si (b) vous semble acceptable;
- ✓ c si les deux semblent acceptables;
- ✓ d si elles ne semblent pas acceptables.

Notez que, par "acceptable", nous espérons faire appel à vos intuitions sur la langue plutôt qu'à votre respect des normes linguistiques ou à votre adhésion à des règles prescriptives. En d'autres termes, vous pouvez ne pas aimer ou tolérer l'alternance de langues en tant que pratique sociale, mais vous devez néanmoins être en mesure de donner votre avis sur sa forme. Ceci n'est pas un test pour déterminer si vous parlez bien l'espagnol, ni d'une prescription sur la manière dont l'espagnol doit être parlé.

Si vous avez des questions concernant ces instructions ou si vous trouvez des éléments de vocabulaire peu familiers, veuillez lever la main pour attirer l'attention du moniteur.

Questionnaire

1. (a) Plusieurs de mes étudiants *llegaron tarde a la conferencia del jueves.*
   (b) *Varios de mis estudiantes* sont arrivés en retard pour le cours du jeudi.
   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

2. (a) *Los estudiantes han elegido* un nouveau représentant.
   (b) *Los estudiantes han* élu un nouveau représentant.
   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

3. (a) *Los profesores de química* qui ont mené les recherches ont remporté un prix.
   (b) *Los profesores de química que* ont mené les recherches ont remporté un prix.
   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

4. (a) Sur ce campus, *muchos estudiantes andan en bicicleta*.
   (b) Sur ce campus, de nombreux *estudiantes andan en bicicleta*.
   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

5. (a) *La biblioteca normalmente* n'ouvre pas le dimanche matin.
   (b) *La biblioteca normalmente no* ouvre pas le dimanche matin.
   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

6. (a) *Los actores presentaron la obra* devant un public réceptif.
   (b) *Los actores presentaron la obra en frente de* un public réceptif.

___ (a) est acceptable ___ (b) est acceptable
___ (c) les deux sont acceptables ___ (d) aucun est acceptable

7. (a) L'encouragement des parents à leurs enfants *es muy importante*.
   (b) L'encouragement des parents *para sus hijos es muy importante*.

___ (a) est acceptable ___ (b) est acceptable
___ (c) les deux sont acceptables ___ (d) aucun est acceptable

8. (a) Le nouveau café *servirá desayuno hasta las once*.
   (b) Le nouveau café servira *desayuno hasta las once*.

___ (a) est acceptable ___ (b) est acceptable
___ (c) les deux sont acceptables ___ (d) aucun est acceptable

9. (a) La clinique ne traite pas les étudiants qui *no tienen seguro médico*.
   (b) La clinique ne traite pas les étudiants *que no tienen seguro médico*.

___ (a) est acceptable ___ (b) est acceptable
___ (c) les deux sont acceptables ___ (d) aucun est acceptable

10. (a) Un document important a été trouvé parmi *las páginas de la biblia*.
    (b) Un document important a été trouvé *entre las páginas de la biblia*.

___ (a) est acceptable ___ (b) est acceptable
___ (c) les deux sont acceptables ___ (d) aucun est acceptable

11. (a) Les administrateurs ont ignoré *los gritos de los manifestadores*.
    (b) Les administrateurs *ignoraban los gritos de los manifestadores*.

___ (a) est acceptable ___ (b) est acceptable
___ (c) les deux sont acceptables ___ (d) aucun est acceptable

12. (a) *El equipo de fútbol está* entraîne sur le terrain.

(b) *El equipo de fútbol está practicando* sur le terrain.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

13. (a) Le professeur a annoncé que *la clase había sido cancelada*.

(b) Le professeur a annoncé *que la clase había sido cancelada*.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

14. (a) *Esta tarde voy a comprar dos* livres pour mon cours d'espagnol.

(b) *Esta tarde voy a comprar* deux livres pour mon cours d'espagnol.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

15. (a) *Las reglas se postulan en contra de* la mauvaise conduite des étudiants.

(b) *Las reglas se postulan* contre la mauvaise conduite des étudiants.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

16. (a) *La maestra cansada* par les longues heures d'étude s'est endormie pendant la réunion.

(b) La fatiguée *maestra se durmió durante la reunión*.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

17. (a) L'étudiant fier *celebraba en San Antonio*.

(b) L'étudiant fier *de sus éxitos celebraba en San Antonio*.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

18. (a) Le rédacteur en chef du journal avait écrit *un fuerte comentario*.

(b) Le rédacteur en chef du journal avait *escrito un fuerte comentario*.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

19. (a) *El estudiante no sabe* que son examen sera fait à la maison.

(b) *El estudiante no sabe que* son examen sera fait à la maison.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

20. (a) *Muchos departamentos tienen* trois cents étudiants dans la spécialité.

(b) *Muchos departamentos tienen tres* cents étudiants dans la spécialité.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

21. (a) Dans les établissements publics *pocos estudiantes se gradúan en cuatro años.*

(b) Dans les établissements publics peu de *estudiantes se gradúan en cuatro años.*

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

22. (a) L'étudiant en physique *no va al laboratorio en los fines de semana.*

(b) L'étudiant en physique ne *va al laboratorio en los fines de semana.*

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

23. (a) L’étudiant a laissé le chien enjoué sous *el árbol en el parque*.

(b) L’étudiant a laissé le chien enjoué *debajo de el árbol en el parque*.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

Appendix B: Acceptability Judgment Task, English-Spanish code-switching version (Experiment 1)

Acceptability Judgment Task

Instructions

On the following pages is a list of pairs of sentences. These involve switching between Spanish and English at different points in the sentence. Although you may never have heard or read this type of sentence, you can form an opinion about what sounds acceptable.

After you read each pair of sentences carefully, indicate whether one or both or neither of the sentences sound acceptable to you. Please give your initial response to the set of sentences. Again, read each sentence carefully before you answer. Then, put a checkmark in the appropriate space:

✓ a if (a) sounds acceptable;

✓ b if (b) sounds acceptable;

✓ c if they both sound acceptable.

✓ d if they neither sound unacceptable.

Bear in mind that by *acceptable*, we hope to draw on your intuitions about language rather than your compliance to normative pressures or adherence to prescriptive rules. In other words, you may not like or condone language switching as a social practice, but you should nevertheless be able to offer an opinion on its form. This is not a test of how well you speak Spanish; nor is it a prescription for how Spanish should be spoken.

If you have any questions concerning these instructions or encounter unfamiliar vocabulary items, please raise your hand to call the attention of the instructor.

Questionnaire

1. (a) Several of my students *llegaron tarde a la conferencia del jueves.*
   (b) *Varios de mis estudiantes* arrived late for Thursday's lecture.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

2. (a) *Los estudiantes han elegido* a new representative.
   (b) *Los estudiantes han* elected a new representative.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

3. (a) *Los profesores de química* that conducted the research won a prize.
   (b) *Los profesores de química que* conducted the research won a prize.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

4. (a) On this campus *muchos estudiantes andan en bicicleta*.
   (b) On this campus many *estudiantes andan en bicicleta*.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

5. (a) *La biblioteca normalmente* does not open on Sunday mornings.
   (b) *La biblioteca normalmente no* opens on Sunday mornings.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

6. (a) *Los actores presentaron la obra* in front of receptive audiences.
   (b) *Los actores presentaron la obra en frente de* receptive audiences.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

7. (a) Parents' encouragement of their children *es muy importante*.
   (b) Parents' encouragement *para sus hijos es muy importante*.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

8. (a) The new coffee shop will *servir desayuno hasta las once*.
   (b) The new coffee shop will serve *desayuno hasta las once*.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

9. (a) The clinic does not treat students that *no tienen seguro médico*.
   (b) The clinic does not treat students *que no tienen seguro médico*.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

10. (a) An important document was found between *las páginas de la biblia*.
    (b) An important document was found *entre las páginas de la biblia*.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

11. (a) The administrators ignored *los gritos de los manifestadores*.
    (b) The administrators *ignoraban los gritos de los manifestadores*.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

12. (a) *El equipo de fútbol está* practicing on the field.
    (b) *El equipo de fútbol está practicando* on the field.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

13. (a) The teacher announced that *la clase había sido cancelada*.

    (b) The teacher announced *que la clase había sido cancelada*.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

14. (a) *Esta tarde voy a comprar dos* books for my Spanish class.

    (b) *Esta tarde voy a comprar* two books for my Spanish class.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

15. (a) *Las reglas se postulan en contra de* student misconduct.

    (b) *Las reglas se postulan* against student misconduct.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

16. (a) *La maestra cansada* from long hours of study fell asleep during the meeting.

    (b) The overworked *maestra se durmió durante la reunión*.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

17. (a) The student *orgulloso celebraba en San Antonio*.

    (b) The student proud *de sus éxitos celebraba en San Antonio*.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

18. (a) The editor of the paper had written *un fuerte comentario*.

    (b) The editor of the paper had *escrito un fuerte comentario*.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

19. (a) *El estudiante no sabe* that his exam will be take-home.
    (b) *El estudiante no sabe que* his exam will be take-home.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

20. (a) *Muchos departamentos tienen* three hundred students in the major.
    (b) *Muchos departamentos tienen tres* hundred students in the major.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

21. (a) At public institutions *pocos estudiantes se gradúan en cuatro años.*
    (b) At public institutions few *estudiantes se gradúan en cuatro años.*

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

22. (a) The physics student does *no va al laboratorio en los fines de semana.*
    (b) The physics student does not *va al laboratorio en los fines de semana.*

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

23. (a) The student left the playful dog underneath *el árbol en el parque*.
    (b) The student left the playful dog *debajo de el árbol en el parque*.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

Appendix C: Self-paced Reading Task Stimuli (Experiment 2)

SPRT Stimuli per condition
Aux-VP
L'avocat peut abandonner el caso por la tarde del jueves.
The lawyer might abandon el caso por la tarde del jueves.
El abogado puede abandonar the case this Thursday in the afternoon.
El abogado puede abandonar le dossier ce jeudi pendant l'après-midi.
* L'avocat peut abandonar el caso por la tarde del jueves.
*The lawyer might abandonar el caso por la tarde del jueves.
*El abogado puede abandon the case this Thursday in the afternoon.
*El abogado puede abandonner le dossier ce jeudi pendent l'après-midi.
I think that those cyclists deben usar sus cascos durante las prácticas.
Je pense que ceux cyclistes deben usar sus cascos durante las prácticas.
Yo pienso que esos ciclistas should wear their helmets while participating.
Yo pienso que esos ciclistas devraient porter leur casques pendant la pratique.
*I think that those cyclists should usar sus cascos durante durante las prácticas.
*Je pense que ceux cyclistes devraient usar sus cascos durante las prácticas.
*Yo pienso que esos ciclistas deben wear their helmets while training.
*Yo pienso que esos ciclistas deben porter leur casques pendant la pratique.
Complementizer/TP
Il est le journaliste que enseña el taller de periodismo.
He is the journalist que enseña el taller de periodismo.
Él es el periodista that teaches the Journalism Workshop.
Él es el periodista qui enseigne le cours «Atelier de presse».
*Il est le journaliste qui enseña el taller de periodismo
*He is the journalist that enseña el taller de periodismo.
*Él es el periodista que teaches the Journalism Workshop.
* Él es el periodista que enseigne le cours «Atelier de presse».
There are some students que toman el autobús escolar.
Il y a des élèves que toman el autobús escolar.
Hay algunos estudiantes that take the school bus.
Hay algunos estudiantes qui prennent l'autobus scolaire.
*There are some students that toman el autobús escolar.
*Il y a quelques élèves qui toman el autobús escolar.
*Hay algunos estudiantes que take the school bus.
*Hay algunos estudiantes que prennent l'autobus scolaire.

Neg.

Los niños ne regardent pas le film sur ces ours.
Los niños do not watch the film about those bears.
The children no han visto el film sobre los osos.
Les enfants no han visto el film sobre los osos.
* Los niños no regardent pas le film sur ces ours.
* Los niños no watch the film about those bears.
*The children have not visto el film sobre los osos.
*Les enfants n'ont pas visto el film sobre los osos.

La bilbioteca no abre on Saturdays after 5pm.
La biblioteca no abre les samedis après 5 heures.
The library has not opened los sábados en la mañana.
La biblioteca ouvre pas les samedis après 5 heures.
*La biblioteca no opens on Saturdays after 5pm.
* La biblioteca no ouvre pas les samedis après 5 heures.
*The library has not abierto los sábados en la mañana.
*La biblioteca abre pas les samedis après 5 heures.

Quant.

Mes amis ont deux livres sobre la historia de América.
My friends have two books sobre la historia de América.
Mis amigos tienen dos libros on American history
Mis amigos tienen dos libros sur l'histoire américaine
* Mes amis ont deux libros sobre la historia de América.
* My friends have two libros sobre la historia de América.
* Mis amigos tienen dos books on American history
* Mis amigos tienen dos livres sur l'histoire américaine

We need dos salones de clase con computadores para el lunes.
On a besoin de dos salones de clase con computadores para el lunes.
Necesitamos two classrooms with computers for next Monday.
Necesitamos deux salles de classe avec des ordinateurs pour lundi prochain.
*We need two salones de clase con computadores para el lunes.
*On a besoin de deux salones de clase con computadores para el lunes.
*Necesitamos dos classrooms with computers for next Monday.
*Necesitamos dos salles de classe avec des ordinateurs pour lundi prochain.

Conj.

Les enfants chantent y bailan una canción después de la clase.
The children sing y bailan una canción después de la clase.
Los niños cantan and dance a song after class.
Les enfants chantent and dance a song after class.
*Los niños cantan y dance a song after class.
*Les enfants chantent y dance a song after class.
*Les enfants chantent et bailan una canción después de la clase.
*The children sing and bailan una canción después de la clase.

They came pero no trajeron galletas de chocolate.
Ils viennent pero no traen galletas de chocolate.
Ellos vinieron but they did not bring chocolate cookies.
Ellos vinieron mais ils ont pas apporté des biscuits de chocolat.
*Ellos vinieron pero they did not bring chocolate cookies.
*Ellos vinieron pero ils ont pas apporté des biscuits de chocolat.
*They came but no trajeron galletas de chocolate.
*Ils viennent mais no traen galletas de chocolate.

Prep

L'étudiant a laissé le chien enjoué sous el árbol en el parque.
The student left the playful dog underneath del árbol en el parque.
El estudiante dejó el perro juguetón debajo the tree in the park .
El estudiante dejó el perro juguetón debajo l'arbre dans le parc.
*L'étudiant a laissé le chien enjoué debajo del árbol en el parque.
* The student left the playful dog debajo el árbol en el parque.
*El estudiante dejó el perro juguetón underneath el árbol en el parque.
*El estudiante dejó el perro juguetón sous el árbol en el parque.

Adj.

Le maire, heureux con la noticia, llamó a su asistente.
The mayor, happy con la noticia, llamó a su asistente.
El alcalde feliz with the news called his assistant.
El alcalde feliz de la nouvelle, a appelé son assistant.
*Hier soir, l'heureux alcalde llamó a su asistente.
*Last night, the happy alcalde llamó a su asistente.
*Anoche el alcalde happy called his assistant.
*Anoche el alcalde heureux a appelé son assistant

Appendix D: Self-paced Reading Task - Mean results for the seven CS boundaries tested (SD is given in parenthesis)

	Aux+V		Neg		Quant		Compltzr	
	G	**U**	**G**	**U**	**G**	**U**	**G**	**U**
L1 Eng-L2 Spa Beg	1534,33	1675,60	1791,48	1709,02	1258,77	1217,60	1479,56	1435,00
(n=12)	(591,36)	(710,65)	(746,84)	(797,46)	(388,14)	(456,03)	(673,46)	(426,60)
L1 Eng-L2 Spa Int	1512,89	1786,46	1680,96	1805,16	1156,68	1290,09	1300,39	1490,85
(n=20)	(523,59)	(702,41)	(572,32)	(767,36)	(320,67)	(390,32)	(308,28)	(323,99)
L1 Fre-L2 Spa Int	1747,23	1848,65	1691,81	2067,15	1317,88	1458,67	1417,08	1409,88
(n=12)	(519,97)	(597,37)	(607,67)	(705,92)	(683,06)	(553,26)	(405,65)	(467,11)

	Conj		Prep		Adj	
	G	**U**	**G**	**U**	**G**	**U**
L1 Eng-L2 Spa Beg	1304,42	1288,60	1522,67	1408,33	2187,29	2481,92
(n=12)	(438,47)	(300,37)	(836,55)	(739,35)	(823,42)	(1167,35)
L1 Eng-L2 Spa Int	1313,58	1336,11	1564,35	2578,88	1863,83	2201,55
(n=20)	(412,97)	(541,05)	(740,31)	(2010,97)	(795,39)	(1009,25)
L1 Fre-L2 Spa Int	1439,83	1511,52	1576,00	1607,29	1785,13	1797,00
(n=12)	(666,96)	(530,17)	(733,12)	(467,44)	(502,32)	(819,43)

Appendix E: Acceptability Judgment Task, French-Spanish code-switching version (Experiment 2)

Tâche de jugement d'acceptabilité

Instructions

Vous trouverez dans les pages suivantes une liste de paires de phrases. Ces phrases impliquent une alternance codique entre l'espagnol et le français à différents moments de la phrase. Il est possible que vous n'ayez jamais entendu ou lu ce type de phrase, mais vous pouvez vous faire une opinion sur ce qui vous semble acceptable.

Après avoir lu attentivement chaque paire de phrases, indiquez si l'une des phrases, les deux ou aucune d'entre elles vous semblent acceptables. Veuillez donner votre réponse initiale à la série de phrases. Là encore, lisez attentivement chaque phrase avant de répondre. Ensuite, cochez l'espace approprié:

- ✓ a si (a) vous semble acceptable;
- ✓ b si (b) vous semble acceptable;
- ✓ c si les deux semblent acceptables;
- ✓ d si elles ne semblent pas acceptables.

Notez que, par "acceptable", nous espérons faire appel à vos intuitions sur la langue plutôt qu'à votre respect des normes linguistiques ou à votre adhésion à des règles prescriptives. En d'autres termes, vous pouvez ne pas aimer ou tolérer l'alternance de langues en tant que pratique sociale, mais vous devez néanmoins être en mesure de donner votre avis sur sa forme. Ceci n'est pas un test pour déterminer si vous parlez bien l'espagnol, ni d'une prescription sur la manière dont l'espagnol doit être parlé.

Si vous avez des questions concernant ces instructions ou si vous trouvez des éléments de vocabulaire peu familiers, veuillez lever la main pour attirer l'attention du moniteur.

Questionnaire

1. (a) Chaque semestre, les étudiants han visto la película en el auditorio.
   (b) Chaque semestre, les étudiants ont visto la película en el auditorio.

   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

2. (a) L'étudiant a laissé le chien enjoué sous el árbol en el parque.
   (b) L'étudiant a laissé le chien enjoué debajo del árbol en el parque.

   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

3. (a) Hay estudiantes que son dedicados y organisés dans cette classe.
   (b) Hay estudiantes que son dedicados et organisés dans cette classe.

   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

4. (a) Hoy tengo dos cours pendant le matin.
   (b) Hoy tengo dos clases pendant le matin.

   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

5. (a) Esta es la lista de personas que ont participé au comité.
   (b) Esta es la lista de personas qui ont participé au comité.

   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

6. (a) J'ai pas estudiado la lección de matemáticas porque no me interesa.
   (b) Je n'ai pas étudié la lección de matemáticas porque no me interesa.

   ___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

7. (a) Je préfère des chats y los perros que sean muy activos.
   (b) Je préfère des chats et los perros que sean muy activos.
   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

8. (a) Il y a des étudiants qui sont dédiés et organizados en esta clase.
   (b) Il y a des étudiants qui sont dédiés y organizados en esta clase.
   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

9. (a) Cada semestre, los estudiantes han vu le film dans la salle.
   (b) Cada semestre, los estudiantes ont vu le film dans la salle.
   ___ (a) est acceptable ___ (b) est acceptable
   ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

10. (a) Elle a acheté trois livres en la librería.
    (b) Elle a acheté trois libros en la librería.
    ___ (a) est acceptable ___ (b) est acceptable
    ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

11. (a) Voici la liste des personnes qui participaron en el comité.
    (b) Voici la liste des personnes que participaron en el comité.
    ___ (a) est acceptable ___ (b) est acceptable
    ___ (c) les deux sont acceptables ___ (d) aucun est acceptable

12. (a) Los profesores han publié les résultats de l'examen.
    (b) Los profesores ont publié les résultats de l'examen.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

13. (a) Mi hermana no étudie la leçon de science parce que ça ne l'intéresse pas.

(b) Mi hermana no estudia la leçon de science parce que ça ne l'intéresse pas.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

14. (a) Aujoud'hui j'ai deux clases de inglés en la mañana.

(b) Aujoud'hui j'ai deux courses de inglés en la mañana.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

15. (a) L'étudiant intéressé par le sujet escucha la clase.

(b) L'étudiant interesado escucha la clase.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

16. (a) Les enseignants han publicado los resultados del examen.

(b) Les enseignants ont publicado los resultados del examen.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

17. (a) Los estudiantes que habitent ici peuvent commencer.

(b) Los estudiantes qui habitent ici peuvent commencer.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

18. (a) Mis hermanos no lisent le conte en anglais.

(b) Mis hermanos no leen le conte en anglais.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

19. (a) Yo prefiero los gatos y des chiens qui soient actifs.

(b) Yo prefiero los gatos et des chiens qui soient actifs.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

20. (a) Ella compró tres livres à la librerie.

(b) Ella compró tres libros à la librerie.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

21. (a) Mes frères n'ont pas leído el cuento escrito en inglés.

(b) Mes frères n'ont pas lu el cuento escrito en inglés.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

22. (a) Les étudiants que viven aquí pueden empezar.

(b) Les étudiants that viven aquí pueden empezar.

___ (a) est acceptable ___ (b) est acceptable

___ (c) les deux sont acceptables ___ (d) aucun est acceptable

Appendix F: Acceptability Judgment Task, English-Spanish code-switching version (Experiment 2)

Instructions

On the following pages is a list of pairs of sentences. These involve switching between Spanish and English at different points in the sentence. Although you may never have heard or read this type of sentence, you can form an opinion about what sounds acceptable.

After you read each pair of sentences carefully, indicate whether one or both or neither of the sentences sound acceptable to you. Please give your initial response to the set of sentences. Again, read each sentence carefully before you answer. Then, put a checkmark in the appropriate space:

✓ a if (a) sounds acceptable;

✓ b if (b) sounds acceptable;

✓ c if they both sound acceptable.

✓ d if they neither sound unacceptable.

Bear in mind that by *acceptable*, we hope to draw on your intuitions about language rather than your compliance to normative pressures or adherence to prescriptive rules. In other words, you may not like or condone language switching as a social practice, but you should nevertheless be able to offer an opinion on its form. This is not a test of how well you speak Spanish; nor is it a prescription for how Spanish should be spoken.

If you have any questions concerning these instructions or encounter unfamiliar vocabulary items, please raise your hand to call the attention of the instructor.

Questionnaire

1. (a) Ella compró tres books in the bookstore.
   (b) Ella compró tres libros in the bookstore.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

2. (a) Cada semestre, los estudiantes han seen the movie in the auditorium.
   (b) Cada semestre, los estudiantes have seen the movie in the auditorium.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

3. (a) The student left the playful dog underneath del árbol en el parque.
   (b) The student left the playful dog debajo el árbol en el parque.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

4. (a) Hay estudiantes que son dedicados y organized in this class.
   (b) Hay estudiantes que son dedicados and organized in this class.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

5. (a) Below the list of people that participaron en el comité.
   (b) Below the list of people que participaron en el comité.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

6. (a) I have not estudiado la lección de matemáticas porque no me interesa.
   (b) I have not studied la lección de matemáticas porque no me interesa.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

7. (a) The student interested in the subject escucha la clase.
   (b) The student interesado escucha la clase.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

8. (a) Yo tengo dos interviews scheduled this week.
   (b) Yo tengo two interviews scheduled this week.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

9. (a) There are students who are dedicated and organizados en esta clase.
   (b) There are students who are dedicated y organizados en esta clase.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

10. (a) An important document was found between *las páginas de la biblia*.
    (b) An important document was found *entre las páginas de la biblia*.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

11. (a) Yo prefiero los gatos y dogs that are very active.
    (b) Yo prefiero los gatos and dogs that are very active.

___ (a) is acceptable ___ (b) is acceptable
___ (c) both are acceptable ___ (d) neither is acceptable

12. (a) Los estudiantes que live here may start.

(b) Los estudiantes that live here may start.

___ (a) is acceptable ___ (b) is acceptable

___ (c) both are acceptable ___ (d) neither is acceptable

13. (a) The teachers han publicado los resultados del examen.

(b) The teachers have publicado los resultados del examen.

___ (a) is acceptable ___ (b) is acceptable

___ (c) both are acceptable ___ (d) neither is acceptable

14. (a) Esta es la lista de personas que participated in the comitee.

(b) Esta es la lista de personas that participated in the comitee.

___ (a) is acceptable ___ (b) is acceptable

___ (c) both are acceptable ___ (d) neither is acceptable

15. (a) I have two entrevistas durante esta semana.

(b) I have two interviews durante esta semana.

___ (a) is acceptable ___ (b) is acceptable

___ (c) both are acceptable ___ (d) neither is acceptable

16. (a) Mis hermanos no read the story in English.

(b) Mis hermanos no leen the story in English.

___ (a) is acceptable ___ (b) is acceptable

___ (c) both are acceptable ___ (d) neither is acceptable

17. (a) I prefer cats y perros que sean muy activos.

(b) I prefer cats and perros que sean muy activos.

___ (a) is acceptable ___ (b) is acceptable

___ (c) both are acceptable ___ (d) neither is acceptable

18. (a) Los profesores han posted the test results of the exam.

    (b) Los profesores have posted the test results of the exam.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

19. (a) Every semester, the students han visto la película en el auditorio.

    (b) Every semester, the students have visto la película en el auditorio.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

20. (a) The students que viven aquí pueden empezar.

    (b) The students that viven aquí pueden empezar.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

21. (a) My brothers have not leído el cuento escrito en inglés.

    (b) My brothers have not read el cuento escrito en inglés.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

22. (a) She bought three books en la librería.

    (b) She bought three libros en la librería.

    ___ (a) is acceptable ___ (b) is acceptable

    ___ (c) both are acceptable ___ (d) neither is acceptable

Appendix G: Research Ethics Certificate

Western Research

Research Ethics

Western University Health Science Research Ethics Board
NMREB Delegated Initial Approval Notice

Principal Investigator: Joyce Bruhn de Garavito
Department & Institution: Arts and Humanities\Modern Languages & Literatures,Western University

NMREB File Number: 105415
Study Title: Spanish Heritage Speakers vs. Spanish Language Learners: Grammatical Intuitions and Language Attitudes towards code switching in Anglophone and Francophone Contexts
Sponsor:

NMREB Initial Approval Date: June 24, 2014
NMREB Expiry Date: November 30, 2014

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Instruments		
Instruments		
Instruments		
Recruitment Items		
Instruments		
Instruments		
Response to Board Recommendation		
Revised Western University Protocol		
Revised Letter of Information & Consent		

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the HSREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of HSREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

This is an official document. Please retain the original in your files.

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Montoya, Lilliana. (2020). (Under review). Code-Switching in L2 Spanish: A comparison of French and English learners.